JPRS-UAG-85-033 30 DECEMBER 1985

# **USSR** Report

**AGRICULTURE** 



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SOLUTION OF REGIONAL FEED PROTEIN PRODUCTION PROBLEMS URGED

Moscow SELSKAYA ZHIZN in Russian 25 Oct 85 p 1

/Editorial: "Solving the Protein Problem in a Persistent Manner"/

/Excerpt/ During the 12th Five-Year Plan, the APK /agroindustrial complex/collectives must utilize effectively their increasing economic potential, surpass noticeably the results already achieved, raise considerably the production of farming and livestock husbandry products and satisfy completely the state's requirements for food goods and raw materials. An urgent task in this regard is that of further strengthening the feed base, which is a principal factor with regard to raising the productivity of the livestock and poultry and increasing the procurements of meat, milk and eggs. In recent years the kolkhozes and sowkhozes have begun to devote greater attention to feed production, attaching to it a branch or specialized character, and this has promoted an increase in the feed supplies and growth in the productivity of the animals.

But as yet only the first step has been taken in this direction. A tremendous amount of work still remains to be carried out in connection with raising the quality of the feed and increasing the return from each kilogram of forage. Although at the present time many farms have improved the availability of feed for their livestock, they have still been unable to achieve the planned level of productivity. One element has turned out to be extremely weak -- a considerable protein deficit in the animal rations, especially during the winter. The mixed feed is far from being balanced in terms of protein and this leads to an overexpenditure of all types of feed and to reductions in the weight increases for the cattle, hogs and poultry. A large portion of the grain forage at kolkhozes and sovkhozes is being fed to the animals with no enrichment with protein components. As a result of such mismanagement, the feed expenditures per quintal of weight increase are doubling and tripling in a number of areas.

The tasks for the accelerated intensification of agriculture, assigned to the agroindustrial complex by the party, require decisive action aimed at increasing the production of plant protein and eliminating the protein deficit in feed. This problem must be solved immediately; it cannot be postponed for even one day. At the present time, with the preliminary results of the season being summarized on the farms and the plans being prepared for the year and for the five-year plan as a whole, importance is being attached to carrying out

practical work aimed at increasing the protein yield sharply, immediately following intensification of the grain fields. Here we have in mind primarily an expansion of the sowings, an increase in cropping power and growth in the production of peas, soybeans, lupine, alfalfa, clover, rape, vetch and other high protein pulse, oil-bearing and technical crops. At each kolkhoz and sovkhoz and in each rayon, depending upon the specific conditions and in conformity with the zonal farming systems, the means can and should be found for the additional sowing of these crops. Moreover, they should be provided with an intensive technology and the best agricultural practices for cultivation, such that in the future each hectare will furnish a high protein yield.

Many leading collectives have already achieved fine results in this regard. The kolkhozes and sovkhozes in Kirovskiy Rayon in Stavropol Kray created a complete system for the production of high protein feed. This year 104 quintals of feed units will be obtained here per hectare and each quintal will contain 110 grams of protein. This is twice as much as is being obtained in a number of other rayons in the north Caucasus. What produced this result? First of all, there was creative and industrious work on the part of the rayon party organization, the RAPO /rayon agroindustrial association/ and all of the farmers and livestock breeders. In addition, the farms singled out feed production as an independent branch. The teams, brigades and sectors are operating on the basis of a collective contract. The structure of the feed fields was reviewed taking into account the modern farm requirements. The sowings of alfalfa, peas, rape, soybeans and vetch on large areas were expanded and multiple-component mixtures which furnish maximum quantities of protein-vitamin feed are being cultivated. As a result of such beneficial forage, the kolkhozes Orlovskiy, 40 Let Oktyabrya, Kommunisticheskiy Mayak and others are achieving high results in the production of livestock products. The soil-climatic conditions found in Omsk and Cherkassy oblasts are different from those in Stavropol Kray. But even here opportunities have been found for solving the protein problem.

Unfortunately, this does not hold true for many kolkhozes and sovkhozes in the Calltral, Volgo-Vyatsk, Volga and Urals economic regions, where very little attention is being given to the pulse crops and where there is a shortage of feed protein in the animal rations. This then explains the low weight increases and milk yields and also the low output of farm products. The low yields produced a situation wherein the plan for selling pulse crop grain to the state was fulfilled here by only 11-30 percent. It would seem that this situation should be corrected on an urgent basis. But this did not happen. In Bryansk, Kostroma, Yaroslavl and Vologda oblasts, only one fifth of the pulse seed required was placed in storage. The headers of farms and agricultural industries must analyze thoroughly those factors which are holding back the production of protein and they must undertake effective measures aimed at expanding the pulse crop fields and obtaining high and stable yields.

The farmers in all zones of the country possess an adequate assortment of protein crops, the proper use of which can raise the quality of the feed sharply within a brief period of time. Among these crops an important role is played by peas, the grain of which contains up to 20 percent protein and in its straw -- 3 percent. Although the gross yield of peas has increased in a number

areas, nevertheless it is still inadequate for satisfying the farm and state requirements. Yes and the yields are low because technological discipline is weak, a complex of machines is lacking and grain losses are being tolerated. In addition to peas, opportunities must be sought for expanding the sowings of peavine, chick peas, lentils and fodder beans.

In many regions, for example in the Amur area, the southern Ukraine, north Caucasus and Volga area, the protein problem can be solved by means of soybeans. Such a trend is conditioned by the exceptionally rich chemical structure and the potential afforded by the use of its grain. Over a period of 100 days of growth, 30 percent of the protein, 25 percent of the fat and many vitamines and mineral salts accumulate in the grain. However the yields for this crop continue to remain extremely low owing to violations of the agricultural practices and a weak technical base. In addition to an increase in the soybean yield in pure form, it must also be employed extensively in mixed sowings. The scientists have estimated that a combined sowing of corn and soybeans for silage on 8.5 million hectares cab fyrbusg 1.3 million tons of protein. And this is with no expansion in the sowing areas!

And what tremendous protein reserves are embodied in perennial leguminous grasses! A ton of alfalfa hay contains approximately one and a half quintals of protein. Only a few forage crops can be compared against alfalfa in terms of carotene content. And then there are our wonderful clovers, which can literally enrich the feed base of the nonchernozem zone and yet, despite this fact, are being buried in oblivion in some areas. Nor has lupine, which produces an outstanding protein-vitamin feed, proven to be any more lucky. For some reason, it is being sown less and less in Belorussia, in the western oblasts of the RSFSR and in the Ukraine.

Sunflower cake and oil-seed meal, rape and other oil-bearing crops can raise noticeably the quality of the feed and thus special attention should be given to raising the cropping power of these crops. The natural feed lands must not be ignored. As a result of the reclamation of these lands and the creation of cultivated pastures and leguminous grass stands, it is possible not only to raise the yields being obtained from the natural lands but also to obtain millions of tons of digestible protein from such land.

A principal factor in the intensification of agriculture is that of increasing considerably the production of plant protein. The solving of this task is being held up to a large degree by the weak nature of the scientific, technological and agronomic works in this area, by the absence of a practical relationship between the zonal NII's /scientific research institutes/ and the farms and by shortcomings in the training of personnel.

The quicker the APK workers solve the feed protein problem, the greater will be the amount of livestock products made available to the country and the more significant will be the contribution by the farmers towards carrying out the tasks of the Food Program.

7026

CSO: 1824/72

#### LIVESTOCK FEED PROCUREMENT

### TECHNOLOGY KEY TO IMPROVEMENT IN SOYBEAN CROP YIELD

Moscow SELSKAYA ZHIZN in Russian 11 October 1985 p 2

[Article by V. Kuzin, director, All-Russian Scientific Research Institute for Soybean, under the rubric "Protein: Ways to a Solution of the Problem": "Woes of the Soybean Field"]

[Text] Since there is no consistent discipline with respect to equipment in the fields and owing to incomplete fleets of farm vehicles the harvests of this valuable crop have been small.

In resolving the protein problem, it is very important that soybean production be increased. There are indeed reasons for this. Yes, its seed contains up to 45 percent high-quality protein including all the essential amino acids as well as 22-24 percent fat and a large number of vitamins and minerals.

Unfortunately, the resolution of the problem is being slowed by low soybean harvests caused by two factors: an insufficient volume of research along with slow and incomplete transfer into production of scientific developments.

The soybean program, ratified by a resolution of the USSR State Committee for Science and Technology in 1979, planned large-scale resolution of the problem with the participation of many institutions of the USSR Ministry of Agriculture (Minselkhoz), the All-Union Academy of Agricultural Sciences imeni V.I. Lenin and the USSR Ministry of Tractor and Agricultural Machine Building. However, there was no special-purpose financing and therefore research was not completed to the full extent. As a result of inadequate scientific support for the branch, sown crops were expanded only slowly into new areas and production of the valuable culture was not highly effective.

Varieties adapted to distinct natural and climatic conditions are the basis of successful soybean cultivation. The selectors at our institute have bred fast-maturing, high-yield and cold-resistant varieties for each microclimatic zone of the Far East. They also show high productivity in the European part of the country, especially the irrigated land. Fields planted to varieties developed at the All-Russian SRI for Soybean make up 58.2 percent of cultures,

The experience of the most progressive farms, brigades and links shows that the high potential of the varieties can be achieved in production. The Pogranichnyy Sovkhoz, Konstantinovskiy Rayon and Partizan Sovkhoz, Tambovskiy Rayon as well as the Test and Demonstration Farm of the All-Russian SRI for Soybean in Amur Oblast obtain from a large area 14-16 quintals soybean per hectare per annum. I note for comparison that soybean crops in Moldavia comprise 13,500 hectares with 7-11 quintals annual yield and in Kazakhstan 1,300 hectares with 7-9.8 quintals.

The current five-year plan has seen the development of 11 soybean varieties; of these, Aurora is specialized for one rayon, whereas Rassvet has been found to show potential for all zones of Amur Oblast. According to data from government research on varieties, it shows good results in Khabarovsk Kray as well as Novosibirsk, Kurgan and Ryazan oblasts and in the Volga region as well as the Ukraine.

In order to continue research projects in detail, it will be necessary to complete the staff at the Selection Center for Soybean to conform to the original model structure, which will make it possible to expand and intensify studies on cold resistance, immunity, resistance to acidity, genetics, physiology and biochemistry.

Soybean cultivation in our Far Eastern Zone is carried on under difficult conditions with respect to soil and climate; at the beginning of growth, a scarcity of moisture obtains, while there is excess moisture in the second half of the summer. The sum of active temperatures varies between 1,600 and 2,200 degrees and the bioclimatic potential is low. According to the combined agrochemical indicators the arable soils are in the low-fertility category: over 70 percent are too acid.

A steep increase in soybean cultures in Amur Oblast in the Eighth and Ninth Five-Year Plans led to two-field rotation of soybeans with grain and often to permanent cultivation. Haphazard cultivation, lack of material and technical means and insufficiently systematic measures in the fight against weeds lead to weediness in the fields and a negative balance of organic substance as well as to oxidation of the soils; this holds back the increase of harvests, which do not exceed five to seven quintals. The most severe problem in crop cultivation in the Far East is the augmentation of soil fertility on the basis of the introduction of cultivation and crop-rotation systems that have been worked out for each of the region's microclimatic zones.

The results obtained by pioneers of science and their studies have shown that a good yield can be obtained from acid soils only when comprehensive research is being done on means of improving soil chemistry and fertilizing fields with minerals. But areas under lime application comprise only one third of the fields, with virtually no increase. In Amur Oblast lime was applied to 83,900 hectares in 1976; 89,500 in 1980; and 78,600 in 1984. According to data from Dalgiprozem Institute, soil acidity has risen by 0.2-0.3 pH compared with the

1960's because liming has increased at a slow rate, whereas the use of mineral fertilizers has risen with respect to soil area.

The increase in volume of mineral fertilization and herbicide use has not been accompanied by heightened development of the technical means for their application. For example, compact-strip application 10-15 centimeters below ground or even during plowing has the greatest effect with respect to fertilization. But only about 10 percent of fertilizer is used this way; on most farms the largest share of fertilizers are applied in finely ground form by scattering or in an increased dose in the row at the time of sowing; this lowers their efficacy and furthers the growth of weeds. Owing to breakdowns of equipment and slow rates of liming the yield from fertilization, disregarding rising volumes of fertilizer applied, is one and one-half to two times lower than that computed.

The extreme weediness of the fields causes an annual 30-70 percent reduction in the soybean yield. Owing to the periodic water-logging of seasonally frozen soils, an intensive fight using agrotechnical means cannot be carried on against the weeds. This problem can be solved through an integrated system of agrotechnical, mechanical and chemical methods. However, the extent to which the need for herbicides is met is extremely unsatisfactory.

The results of work at the Testing and Demonstration Farm and on the most progressive farms show that the key to an increase of the soybean yield lies in introducing industrial technology into cultivation of soybeans on level surfaces as well as crests and ridges. However, such techniques have been put into operation at about 60 percent of potential, on the average owing to the shortage of material and technical means and poor discipline with regard to equipment. On the majority of farms in the zone, a whole number of links of industrial technology are absent: either herbicides or fertilizer is not applied, liming is carried out on too little acreage, insufficient areas of land are prepared for the autumn, crop rotation is not observed or the schedule for mechanized operations is not followed. Instead of 10 days, sowing takes twice as long and the harvest is prolonged to 30-35 days.

When application of industrial technology is faulty, methods do not work in congruity, expenses are not compensated, production costs are excessive and productivity is low. The fact that most technical operations are carried out poorly or off schedule is caused to a considerable extent by the circumstance that there is no complete fleet of specialized vehicles and that serial equipment for applying fertilizers and herbicides and for tending crops is inadequate. In Amur Oblast alone, there is a shortfall of over 500 K-701 tractors, 700 boom sprayers and 300 APZh-12 machines for preparing toxic chemicals.

At the All-Russian SRI for Soybean and the Far East SRI for Agriculture, systematic assemblies of vehicles for soybean cultivation on level surfaces or crests and ridges have been developed, taking the soil and climatic conditions and the demands of the crop into account. The assembly developed at our institute includes the MKP-4 combined vehicle for pre-sowing tillage of the soil and compact-strip application of fertilizer, the PZhU-2.5 aggregate for herbicide application as well as the SPS-12 and SPS-24 soybean seeders, the KBN-10.8 nonclutch cultivator, the low-cut header, the PS-5 pneumatic separator, the NTKh-20 low-speed irrigating wheel and the KOZ-20 continuous seed-cleaning line. In terms of indicators of exploitation of equipment, the fleet surpasses the serial one and makes it possible to cut costs by 35.8 percent.

At the Far Eastern SRI for Agriculture a fleet of vehicles for cultivation of soybeans on crests and ridges has been developed: the SG-12 seeder-cultivator and the BPK-0.35 weeding harrow adapted to serial combines for harvesting on uneven surfaces.

Industrial production of the vehicles ought to have begun back in 1983. Before that agrotechnical requirements were worked out and experimental models were created; a financial review was also carried out and recommendations made to the head construction organizations in Kirovograd, Rostov/Don, Voronezh and Lvov. However, the schedule set for developing the fleet and starting up its industrial production has not been met because the responsible ministries and departments have not resolved the problems of lime application, selection of herbicides for fullscale demand in industrial technology and means of mechanization.

For the successful resolution of urgent problems, it is important that a comprehensive program be worked out without delay to introduce scientific studies and develop soybean cultivation in the 12th Five-Year Plan, to provide special-purpose financing for this and to establish a council at the All-Russian SRI for Soybean or the Main Science Administration of Minselkhoz which is entrusted with coordinating projects and monitoring completion of the program throughout the country.

Along with future plans for scientific and experimental construction projects a concrete program of introducing scientific developments specific to each zone must be worked out, in which selection of the necessary material and technical resources is necessary.

To increase the effectiveness of scientific developments and the accountability for completion of the recommended stocks of equipment, we deem it expedient that all farms have organization and equipment plans, for the fulfillment of which the same requirements obtain as for construction plans.

The realization of these measures, as shown by the results of scientific studies and the leading farms, will make possible an increase to 10-12 quintals per hectare, twice the present number, of the Far East's soybean harvest.

More attention must be paid to the expansion of cultures in which soybeans are combined with other crops for feed purposes. The green mass of soybean is rich in protein, fat and minerals. One quintal contains 3.5-4.2 kg utilizable protein, three to four times the content of the equivalent amount of maize.

Planting maize and soybean crops together on an area of 8.5 million hectares (50 percent of the silage maize) would make it possible to obtain additionally about 1.3 million tons of utilizable protein without expanding the cultivated area.

The large-scale bringing into production of a valuable protein crop will facilitate a reduction in the country's feed-protein shortage.

9582

CSO: 1824/48

LIVESTOCK

UDC 636.22/.28.083"324"

LIVESTOCK SECTOR PROGRESS, WINTER PREPARATIONS

Moscow ZHIVOTNOVODSTVO in Russian No 10, Oct 85 pp 2-4

[Article: "Fall Concerns of Livestock Breeders"]

[Text] The competition of livestock breeders for an appropriate welcome to the 27th CPSU Congress is expanding ever more broadly at kolkhoz and sovkhoz sections every day. Potentials for the further intensification of production and increase in the productivity of livestock and poultry with a view to obtaining more output with the same stock and efficient expenditures of feed, labor and capital are sought and activated in the localities.

Livestock breeders in many oblasts in the Russian Federation, the Ukraine, Belorussia, Georgia, Azerbaijan, Moldavia, the Baltic republics and Armenia are concluding the last year of the 11th Five-Year Plan in a good frame of mind.

Owing to state assistance, high-level organization and skillful utilization of existing potentials another significant step on the path of implementing the large-scale tasks set by the country's Food Program to further increase the production of meat, milk and other products has been taken.

Throughout the country in 8 months of 1985 state purchases of livestock and poultry increased by 3 percent and of milk and eggs, by 2 percent as compared with the corresponding period of last year. The indicators of the productivity of animals improved. The average milk yield per cow increased by 26 kg throughout kolkhozes and sovkhozes. Farms in Belorussia, Moldavia and Latvia sold cattle weighing more than 410 kg and in the Lithuanian SSR the average weight per head totaled 434 kg and in the Estonian SSR, 449 kg.

However, it was not possible to overcome the difficulties caused by adverse weather conditions everywhere. The productivity of animals diminished on many farms in the Kazakh SSR and in Kalinin, Kirov, Orenburg, Perm, Chita and some other oblasts. Uzbekistan's livestock breeders abruptly surrendered the conquered lines. In the republic, milk yields of cows and weight gains in fattening animals declined significantly and meat and milk production was lowered. Indicators of herd reproduction and stock preservation deteriorated in a number of places.

Livestock wintering has now begun at kolkhoz and sovkhoz sections. This is a crucial period. The results of work of the current year, as well as of the first year of the 12th Five-Year Plan, largely depend on how kolkhozes and sovkhozes will carry out this important campaign organizationally. The experience of advanced collectives--winners in the all-Union socialist competition for a successful implementation of livestock wintering in 1884/85--graphically shows that even under complex conditions well-organized work at sections, an efficient utilization of feed and material resources and a close interaction of all the links of the agroindustrial complex make it possible to stably increase the production of products.

Feed largely determines the success of an endeavor concerning an increase in the production of products during the winter period. A great deal was done to procure them as much as possible. Reliable fodder reserves were established on many kolkhozes and sovkhozes in Belorussia and the Baltic republics and on advanced farms in the RSFSR, the Ukraine, Georgia, Azerbaijan, Moldavia and other republics.

Now it is important to take measures to complete the work on feed procurement and to fully bring in all available straw. In a number of rayons feed reserves must be replenished as a result of a better utilization of corn stalks, sunflower heads, sugar beet tops and the waste of food, starch hydrolysis, canning and meat and dairy industries.

It is necessary to improve the organization of the procurement and utilization in hogs' rations of the food waste of public dining enterprises and that collected from the population. Throughout the country in the last 10 years the collection and utilization of food waste increased 1.7-fold. At present it is used for feed for animals on 13,000 farms, which makes it possible to annually save 1.3 to 1.5 million tons of concentrated feed. However, the possibilities of utilization of food waste in the feeding of hogs are by no means fully realized in a number of places. Whereas in Moscow and Leningrad the annual collection of food waste per urban resident is 78 to 84 kg, in the Belorussian SSR and in a number of oblasts in the RSFSR, the Ukrainian SSR, the Georgian SSR and the Moldavian SSR these figures are much lower.

The attention of managers and specialists should now be concentrated on ensuring, from the first days of wintering, high-grade feeding of animals with winter rations and organizing the prompt delivery of feed to sections. This is a very important factor. In the past there have often been cases where milk yields diminished and fat was lost as a result of livestock being kept on pastures too long and being underfed in the search for an imaginary saving of feed.

Even during the current year some kolkhozes and sovkhozes were unable to promptly create at sections feed reserves for the fall period of impassable roads and this immediately forced them out of the usual rhythm of work. Experience shows that in animal husbandry even one neglected day, one irregularity in work, leads to irreparable losses of products and more than one week will be needed to restore the level of their production.

The organization of control over the expenditure of feed plays an important role in the successful implementation of livestock wintering. Farm managers and specialists must register all the available feed resources, including procurements of past years, and establish strict control over their use.

Mismanagement is especially intolerable. Wintering has just begun. However, there are already many caseswhere losses of feed during its delivery to sections are tolerated and hay and straw stacks are piled carelessly, are not plowed around and begin to spoil. Now it is necessary to once again check the state of fodder warehouses and haylage and silage structures, to cover feed carefully, to deliver it according to a certificate for storage to responsible individuals and to organize reliable storage.

Grain forage must be used efficiently. All grain allocated for livestock feed should be fed only in processed form.

It is no less important to expend every kilogram of coarse and succulent feed with a full return. For this it is necessary to include all the available feed shops and kitchens in operation everywhere. More output with the same feed is obtained where its efficient preparation for feeding is organized. Long-term experience has demonstrated that the feed shop is an inseparable link in technology and an important means of increasing the return on feed. In ensuring the trouble-free operation of feed preparing equipment a great deal depends on the coordination in the actions of engineering-technical and repair services of kolkhozes, sovkhozes and subdivisions of the State Committee for Supply of Production Equipment for Agriculture. It must be noted that, recently, these relations have become ever more reliable.

The technical servicing of animal husbandry facilities by the enterprises of the Agricultural Equipment Association in Nizhnekamskiy Rayon in the Tatar ASSR, Kurganinskiy Rayon in Krasnodar Kray, Kamenetskiy Rayon in Brest Oblast and Pasvalskiy Rayon in the Lithuanian SSR is well organized.

Industrial patronage enterprises provide great assistance in the repair of animal husbandry facilities. Therefore, on many farms the available feed preparing equipment has been put into operation.

However, this situation does not exist everywhere. Feed shops on farms in the Kalmyk ASSR and in Karaganda, Chita, Aktyubinsk, Perm, Vitebsk, Transcarpathian and some other oblasts have not been fully prepared for the beginning of wintering.

A warm livestock yard with a good microclimate prepared in time is the most important condition for a successful implementation of livestock wintering. The experience of many farms shows that this makes it possible to significantly reduce the expenditure of feed and to increase the productivity of animals with the same feed. The duty of builders and repair services of farms and enterprises of the State Committee for Supply of Production Equipment for Agriculture is to ensure the trouble-free operation of heating systems, ventilation, manure removing mechanisms and other technological equipment under winter conditions, which will make it possible to create good sanitary and hygienic conditions at every section.

The performance of this important work is often delayed. agricultural equipment associations do not meet the orders of farms for the repair and technical servicing of sections and feed shops. For example, only two-thirds of the available feed shops and about 10 percent of the steam converting boilers have been accepted for servicing in Aktyubinsk Oblast and 10 percent of the electric engines and 72 percent of the feed distributors in Vologda Oblast. Problems concerning the specialized repairs of section and feed shop equipment are solved poorly in a number of oblasts. Only three to six types of machinery and equipment are involved in such repairs. Some farm managers have not transferred equipment for technical servicing to the enterprises of the State Committee for Supply of Production Equipment for Agriculture and, at the same time, have not organized at their sections technical servicing centers, have not staffed them and have not provided them with the necessary materials and tools. All this has a negative effect on the smooth operation of sections and leads to a significant deficiency of products.

Continuous electric supply for animal husbandry sections is of great importancein the organized implementation of livestock wintering. Numerous cases of stoppage of electric power supply are noted in a number of oblasts in the Russian Federation, the Ukraine, Belorussia and Kazakhstan, which leads to a sharp decline in the productivity of animals and to the spoilage of products.

The engineering service of kolkhozes and sovkhozes must intensify its attention to problems of electric supply for animal husbandry sections, repair boiler rooms, air heaters, heating conduits and electric supply lines and ensure the installation, where necessary, of reserve electric power stations.

People determine success in any matter. The working conditions of livestock breeders during the winter period are complex. As a rule, more labor and capital are expended on products obtained in winter. All this requires the adoption of additional measures to improve the production and living conditions of section workers. Well-organized medical services for livestock breeders and the organization of trade and public dining are of great importance.

Kolkhoz and sovkhoz managers and specialists and workers of agricultural agencies in Kazakhstan, the republics of Central Asia and the Transcaucasus, the North Caucasus and some other regions, where a sizable stock of sheep, cattle and horses is on winter pastures, now have especially many concerns. It is necessary to deliver feed to wintering places in advance, to complete the construction and repair of premises, to create normal housing and domestic conditions for shepherds, drovers, herdsmen and other service personnel and to ensure the organization of trade and medical and cultural-general services for livestock breeders in transhumance regions. The operation of medical and sanitary centers for sick and weak livestock must be placed under permanent control. The preservation and productivity of stock during the winter period will largely depend on the solution of these problems.

Herd reproduction problems must be under the daily attention of zoological-veterinary specialists. This is one of the most important potentials for increasing the sector's efficiency and the production of milk, meat and other products. On most farms the offspring of calves, piglets and lambs are obtained during the second half of wintering. However, it is important to be concerned with this right now. Special attention must be given to carefully preparing delivery sections and barns for raising young stock and to creating the appropriate microclimate in them. The method of cold rearing of calves, which has proved its value as a reliable way of obtaining healthy young stock in many of the country's regio, should be introduced more widely.

In all the Union republics, krays and oblasts, along with farms, which annually attain high production and economic indicators, there are many collectives, where productivity is low and production costs remain high.

This year about one-third of the farms in the Russian Federation, the Ukraine, Kazakhstan, the Transcaucasian republics and Moldavia lag in the fulfillment of the plans for the sale of milk, livestock and poultry to the state. Local agricultural agencies must carefully investigate these farms and map out and implement specific measures to raise the level of their work. The transition to cost accounting and introduction of the brigade contract should become the decisive factor. The party's demands—to better manage and to more efficiently utilize the available resources and to work more effectively—should form the basis of work of all the kolkhozes, sovkhozes, enterprises and organizations of the agroindustrial complex.

Practice shows that a sharp improvement in production and economic indicators at times does not require any large-scale measures. Where people are able to raise discipline and organization, where every farm worker understands that the general success of an endeavor depends on his personal contribution, high indicators are attained without fail. This is precisely how the labor collectives of the Ventsy Zarya State Pedigree Stock Farm in Krasnodar Kray, of the Kolkhoz imeni Vladimir Ilich in Moscow Oblast, of the Nazarovskiy Sovkhoz in Krasnoyarsk Kray and of many other farms work.

Publicity, an open discussion of achievements and shortcomings and the participation of managers and specialists of all ranks in political and educational work create in the collective a favorable climate, in which people work with a full return and attain high final results with the smallest expenditures of labor and capital. The practical work of many kolkhozes and sovkhozes shows that in brigades, links and sections working on the principles of the collective contract labor productivity is much higher and production costs are lower.

The biggest economic effect is attained where the brigade contract is introduced simultaneously with the solution of problems of improving the work and rest conditions of livestock breeders. As experience shows, the transition in animal husbandry to two- or one-shift two-cycle working conditions eliminates many problems on the social plane. Workers' free time and the prestige of the occupation of livestock breeders are increased, which, in turn, contributes to the attraction of young people to farms.

The growing scale of work on the introduction of the achievements of scientific and technical progress requires section workers to have profound knowledge of the entire technological process and to be able to utilize the latest machinery and equipment in a highly productive manner.

During the winter period it is necessary to organize personnel training everywhere, to enlist the best specialists as instructors and to see to it that every new section reinforcement successfully masters the experience of advanced workers.

There are no trivial details in the work of livestock breeders in winter. That is why all the problems concerning the course of livestock wintering should be continuously monitored by agricultural agencies and farm managers.

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11439

CSO: 1824/90

UDC 636.22/.28.082.2

# PROGRESS OF PROGRAM FOR BREEDING HIGHLY PRODUCTIVE LIVESTOCK

Moscow ZHIVOTNOVODSTVO in Russian No 7, Jul 85 pp 16-18

[Article by P. N.Korneyev, candidate of agricultural sciences, chief, Main Administration for Animal Husbandry Products, USSR MSKh [Ministry of Agriculture], and Professor B. A. Bagriy, deputy general director, VNPO [All Union Scientific Production Association] for Animal Breeding, USSR MSKh: "Ways to Create Highly Productive Herds"]

[Text] The main factor assuring further intensification of animal husbandry and the successful completion of the Food Program is the organization of balanced nutrition for livestock and improvements in their genetic potential. This will help the creation of highly productive herd. on kolkhozes and sovkhozes.

The genetic potential of animals is to a considerable extent determined by the condition of breedstock [plemenaya baza] and upon the intensification of work to improve and create breeds. An extensive program to develop breeding is under way in the country. Livestock production has a leading role here. The network of breeding farms will make it possible to annually supply artificial insemination stations, kolkhozes and sovkhozes one million head of pedigree young animals. In the past 4 years alone, breeding farms have supplied 4.16 million head of dairy cattle, making it possible to considerably improve breedstock at farms in Kazakhstan, East Siberia, the Far East, the Transcaucasus and Central Asian republics.

The most genetically valuable highly productive animals are concentrated in plemzavody [breeding farms], where selection is governed by the main task — that of improving and creating highly productive animals and herds meeting the requirements of industrial technology and high levels of production intensification. Farms of this type use the most valuable sires and judge them according to their own productivity and the quality of their offspring.

At the Petrovskiy Gosplemzavod in Leningrad Oblast, average milk yield per cow is 6,671 kilograms, at the Lesnoye, in the same oblast, it is 6,604 kg, at the Ploskovskiy in Kiev Oblast, 6,191 kg, at the Petrovskoye and Zarya kommunizma in Moscow Oblast the figures are 5,620 and 5,417 kg. At the plemzavod of the 10 let Oktyabrya Kolkhoz in Chernigov Oblast, the average yield from Simmental cows is 5,010 kg, and at the Chervonyy veleten Kolkhoz in Kharkov

Oblast it is 5,107 kg. Highly productive herds have also been built up at a number of experimental farms of scientific-research institutions. For example, at the Nemchinovka Experimental Demonstration Farm in Moscow Oblast, milk yields averaged 7,273 kg per cow in 1984.

The country's breeding farms have produced a sizable number of animals characterized by extremely high genetic potentials for productivity: 7,500 cows each produce more than 7,000 kg of milk annually. In the RSFSR 588 Cherno-pestryy cows each produce more than 7,000 kg of milk. This includes 16 which produce more than 10,000 kg each; 35 Simmentals produce more than 7,000 kg each. On farms in the Ukraine 444 Cherno-pestryy cows each produce more than 7,000 kg of milk and 11 produce more than 11,000 kg; while 324 Simmentals each produce more than 7,000 kg and 4 more than 10,000 kg; in Belorussia, 127 Black mottled cows each produce more than 7,000 kg and 6 more than 10,000. All these highly productive cows are kept under special supervision and are used produce bulls.

The saturation of the herd with valuable breeding material helps improve the genetic potential of animals on kolkhozes and sovkhozes able to use it. Good results have been obtained in a number of regions in the country. In the Estonian SSR in 1984 milk yields per cow averaged 3,855 kg, in Murmansk Oblast -- 3,900 kg, the Karelian ASSR -- 3,575 kg, Sakhalin Oblast -- 3,530 kg, Leningrad Oblast -- 3,473 kg, Magadan Oblast -- 3,441 kg, and Moscow Oblast -- 3,285 kg. Farms in the Latvian and Lithuanian SSR's average more than 3,000 kg per cow.

In order to form a herd with high dairy productivity potentials it is exceptionally important to properly raise cows with strong builds, good health and harmonious development. Such cows have considerably more intensive protein, salt, water and gas metabolism, increasing the work load on respiratory and circulatory organs and the nervous and glandular systems.

At farms in Gatchinskiy Rayon, Leningrad Oblast the average weight per calf from the first mating rose 20 kg between 1981 and 1984. During this same period milk yields increased from 3,424 to 4,070 kg.

Plemzavods, such as the Petrovskiy and Lesnoye in Leningrad Oblast, where 5,000 kg of milk are obtained from first heifers, give exceptionally great attention to calf raising.

Over a four year period at farms in Lyuberetskiy Rayon, Moskovskiy Oblast, the live weight of calves at the time of first insemination increased by 29 kg, in Odintsovskiy Rayon it increased by 34 kg, in Ramenskiy -- by 27 kg, and in Mytishchenskiy Rayon it increased by 35 kg, increases in milk yields were 279, 555, 711 and 334 kg respectively.

At the Zarya kommunizma Gosplemzavod in Moscow Oblast, an average of 5,028 kg of milk with 3.8 percent fat content was obtained from 708 first heifers.

Thanks to goal directed work in animal raising, at the Pertorvsoye Gosplemzavod in Moscow Oblast, in 1984 live weight per first calf was 429 kg and average yields from the herd increased to 6,671 kg, a 950 kg increase over

1981. At the Kolkhoz-Plemzavod imeni Vladimir Ilich, Leninskiy Rayon, Moscow Oblast, first calf live weight exceeded 400 kg, and last year milk yield per cow averaged 5,561 kg, 312 kg more than in 1981.

A specialized network of farms for raising heifers has been set up to improve the raising of replacement animals. There are now more than 600 such farms, where more than 1 million bull calves and heifers are being raised at a given time. Many heifers are well developed and after calving produce 400-500 kg of mllk more than do animals the same age from commercial farms.

However, because of poor feed supplies, many special farms do not raise calves sufficiently intensively. In 1983 average daily weight gain at special farms was 425 grams. Average age at the first insemination was 20 months. It is therefore very important that each special farm create good feeding and living conditions for calves so that highly productive replacement animals are raised.

The use of proven sires [proizvoditel-ulushatel] is of great importance in creating highly productive herds. Between 1980 and 1984 the proportion of cows impregnated by sperm from proven sires increased from 20.9 to 36 percent; in the Baltic republics it increased to 70 percent.

Qualitative improvements in the herd are accelerated by the extensive introduction of artificial insemination. Sperm banks have been set up at republic and zonal state breeding enterprises — centers for artificial insemination in the RSFSR, the UkSSR, the LiSSR, BSSR, UzSSR and other republics, as well as at scientific institutions (for example the USSR MSkh's VNPO for Breeding, at VNIIRGZh [not further identified], the Ukrainian NII for the Breeding [Razvedeniye] and Artificial Insemination of Cattle, VNIIplem [VNII for Breeding].

During 1980-984 7,862 bulls were evaluated and sperm from approved sires was used to impregnate 32.2 percent of all cows, and sperm from improvement sires on 20.9 percent; in 1981 the figures were 39.8 and 25.4 percent, in 1982, 42.4 and 26.9 percent, in 1983, 47.3 and 32.0 percent respectively.

The task is to rationally use sperm from improvement animals. This sperm is above all intended for use at plemzavody and at other farms with highly productive cattle.

Eighteen thousand bulls with high genetic potentials are used for artificial insemination at state breeding stations. The Central Station for the Artificial Insemination of Agricultural Animals, where the better selection material is concentrated, has a special role in the rational use of the gene pool [genofund]. At the beginning of 1985 this station had 170 sires, 112 of which were Cherno-pestryy (milk yields of the dams were 8,514 kg of 4.22 percent fat milk), milk yields of dams of fathers were 9,383 kg of 4.33 percent). The dams of Cherno-pestryy Holstein Friesian sires yielded 8,634 kg of 4.03 percent, while dams of the fathers yielded 10,584 kg of 4.11 percent fat content milk.

Swiss breeds at this station are also characterized by high genetic potential (milk yields from dams -- 8,551 kg, 4.44 percent fat, from dams of the fathers -- 10, 584, 4.33 percent).

From 1973 to 1984 244 bulls were evaluated here and 170 were chosed to be improvement animals. In 1984 an average of 20,700 doses of sperm per animal were frozen. Last year the largest number of doses were obtained from Andros (51,300), Deyatel (50,200) and Lido (46,500).

The high genetic potential of sires at the station makes it possible to steadily increase the productivity of cows at farms in the zone serviced. Thus, at the plemzivod of the Leninskiy luch Kolkhoz, Moscow Oblast, the milk yield increased from 5,165 kg in 1973 to 6,036 kg in 1984. At the GPZ LGosplemzavod] Zarya kommunizma in Moscow oblast, cow productivity increased from 3,950 kg (1973) to 5,414 kg in 1984, at the Voronovo Sovkhoz in Moscow Oblast from 4,601 to 4,857 kg and at the GPZ imeni Tsvetkova in Kaluga Oblast from 4,011 to 4,276 kg during these years. The productivity of female offspring of 22 improvement sires averaged 4,300 kg of milk during lactation I.

It is very important to use high value [tsennyye] bulls capable of producing highly productive offspring. Thus, during his life, Master, a Holstein-Friesian bull of category  $A_1$  at the Central Station produced 160,200 doses of sperm, from which 23,500 offspring were obtained. The productivity of 42 of his female offspring was 5,845 kg of milk, or 1,277 kg more than other animals of equal age. Landysh, a Black-mottled bull  $(A_1)$  produced 1,200 doses of sperm and 3,515 female offspring. Fifteen of them yielded 5,212 kg (+821 kg). Fifteen female offspring of Don, a Holstein-Friesian bull  $(A_2B_1)$  yielded 5,315 kg of 4.02 percent milk, Don produced 5,000 doses of sperm and sired 12,000 calves.

Gabriel, a Holstein-Friesian bull, was approved in the Lithuanian SSR. Seventy one of his female offspring produced an average 5,143 kg of 3.73 percent milk each. They exceeded other animals of equal age (n=363) by 833 kg, or 22.9 kg of fat. Fifty-one female offspring of Gazon 3459 LChP-1254, a Cherno-pestryy bull, yielded 5,721 kg of milk, 311 kg more than other such animals. This was an A<sub>1</sub> category bull. Milk yields from 23 of the female offspring of Krikun 3036 OChP-1189 averaged 5,211 kg (3.65 percent fat content). They exceeded other animals of equal age (n=308) by 254 kg.

One should note that the quality of bulls used at artificial insemination stations is steadily improving. In practically all regions the genetic potential of their dams exceeds 5,000 kg, and in intensive dairy regions it exceeds 6,000 kg of milk.

The use area of the Cherno-pestryy breed in dairy operations has expanded considerably. In the past ten years its share has risen from 18 to 25 percent and in the long term it is proposed to further increase the herd of this breed. This is understandable, because in plenzavody Cherno-pestryy cows'yield are 700 kg greater than those of other breeds.

Special attention is given to the use of Holstein-Friesian animals. In 1984 a program for improving dairy livestock through using bulls of this breed was worked out and approved. In that same year 3.2 million Cherno-pestryy and straw colored [paleviy] cows were crossed with Holstein-Friesian bulls.

From large amounts of mass production materials one can conclude that the milk yield of Holstein crossed cows exceeds that of Cherno-pestryy by 230 kg, and the former's milk fat is 7,6 kg (6.1 percent) greater. There is practically no difference in the animals' live weight.

On farms with good feeding conditions the crosses' yields exceeded those of other animals by 400-500 kg. Similar results are being obtained at farms such as the Bortnichi and Mytnitsa Gosplemzavody, the Kozhanka Breeding Sovkhoz, the Aleksandrovka OPKh in Kiev Oblast, the Zarya kommunizma Gosplemzavod, the plemzavody at the Leninskiy luch and imeni Vladimir Ilich Kolkhozes, the Yermolino OPkh in Moscow Oblast, the Lensovetovskiy and Volosovskiy Sovkhozes in Leningrad Oblast, the Borovskoye OPKh in Novosibirsk Oblast, the Sovkhoz imeni Tsyurupy in the Bashkir ASSR, and at a number of others.

There are even higher indicators when Krasno-pestryy Holstein-Friesian bulls are crossed with Simmental cows. Compared to other animals of equal age, the crossed cows produced 724 kg (25.7 percent) more milk per lactation. The best farms for breeding Simmental and Holstein-Friesian crosses are the Gosplemzavody imeni Lenin in Tambov Oblast and the Shamrayevskiy in Kiev Oblast.

In 1984, Cherno-pestryy Holstein-Friesian were bred with 33 sires. Krasno-prestryy heifers were delivered to the Gosplemzavody imeni Lenin in Tambov Oblast. Bulls and sperm were also purchased.

All this has noticeable results. At the Zarya kommunizma Plemzavod in Moscow Oblast, Holstein-Friesian cows yielded 6,256 kg of milk (189 kg of butterfat) during lactation I 6,822 kg (224 kg of butterfat) during lactation II, and 7,115 kg of milk (242 kg butter fat) during lactation III. At the Kolkhoz imeni Lenin in Tula Oblast, during lactation I cows of this breed gave 5,347 kilograms of milk (192 kg butter fat) and during lactation III -- 5,826 kg of milk (206 kg butterfat). Holstein-Friesian cows at the experimental farm of the All-Union NII for Feed, Moscow Oblast produced 5,974 kg of milk (216 kg butterfat) during lactation I, 6,649 kg milk (243 kg butterfat) during II, and 6,788 kg milk (255 kg butterfat) during III. Holstein-Friesian sires helped the Petrovskiy Plemzavod in Leningrad Oblast obtain more than 6,500 kg of milk per cow annually.

Great importance is placed upon embryo transplantation, an accelerated method for reproducing highly productive animals, in order to obtain sires. For example, from a donor cow one can obtain 5-10 and more embryos for transplanting to recipient cows. This is a promising method of selection. Four centers for embryo transplantation have been set up at all-union and republic scientific research institutes. These centers are supplied with instruments, equipment and cadre. They manage an additional 20 points set up at breeding enterprises and farms.

In particular, the Zarya kommunizma Plemzavod, Moscow Oblast, is playing an active role. A modern equipped embryo transplant point has already been built here. This plemzavod has more than 60 cows yielding 10,000 kg each. The accelerated breeding of these animals will make it possible to create an embryo bank. Similar work is under way at the Konstantinovo Gosplemzavod, the experimental farms of VIZh [All Union Institute for Animal Husbandry, Shchapovo, Dubrovitsy and Klenovo-Chegodayevo in Moscow Oblast; at the Detskoselskiy, Razdolye, Krasnyy Oktyabr and Lensovetovskiy in Leningrad Oblast, the Ukrainka Experimental Demonstration Farm and the Chervonyy veleten Plemzavod in Kharkov Oblast; the Aleksandrovka and Terezino Breeding Sovkhozes and the Ploskovskiy and Bortichi Plemzavody in Kiev Oblast.

It is now necessary to effectively develop meat production. Meat breed livestock are bred at 16 plemzavody, 72 breeding sovkhozes and at 131 breeding farms [fermy]. This sector has the necessary gene pool and it must be used. It is very important to obtain the maximum number of crossed young animals, which will exceed maternal animals' meat productivity by 10-15 percent.

The gene pool's enrichment through the creation of new breeds is important for the creation of a highly productive herd. In the past 5 years 2 types of meat cattle, Chernigov and Pridneprovskiy, and 27 lines of dairy and meat animals have been obtained.

Word on the creation of new breeds of agricultural animals has been put on a planned basis. A program for their creation has been approved, and creative collectives and base farms determined. A program is under way for breeding Cherno-pestryy, Krasno-pestryy, straw colored and brown cows for dairy purposes, Ukrainian meat and meat Simmental and Zebu-like [Zebuvidnyy] meat breeds.

Success in the program to create new breeds is to a considerable extent determined by the animals' feeding. Measures are being taken to assure balanced feeding of livestock at base farms. Reserves of at least 4,000 feed units of diverse kinds of high quality feeds per standard animal per year are being accumulated.

The building up of highly productive herds also depends upon the level of herd reproduction. In 1984 farms in Crimean and Lvov oblasts obtained 94 calves per 100 cows, in Zhitomir Oblast -- 95, in Volyn Oblast -- 94, and in the Moldavian SSR -- 91 calves. Many farms in the country obtain 100 and more calves per 100 cows. Great attention is given to the training of qualified artificial insemination technicians and to their working conditions.

When sires are intensively used it is necessary to carefully check their parentage. An immunogenetic service has been set up for this purpose. More than 45 laboratories are now functioning in various regions of the country. The production of reagents has begun at the Armavir Biofactory. This zootechnical method is finding increasing application in dairy cattle raising. In 1983 78,000 head of cattle were tested.

In order to improve the labor productivity of selection workers in a number of regions computers are being introduced to process zootechnical and breeding

information. The Higher Selection-Genetic School was created in 1980 at the VNPO for Animal Breeding in order to train selection workers. In 3 years more than 700 specialists have improved their qualifications.

The creation of highly productive herds at kolkhozes and sovkhozes is an urgent task for agricultural organs, breeding services, and farm zootechnicians and selection workers. It is necessary to more completely use genetic potentials, thoroughly improve breeding animals diets and living conditions, to properly raise replacement animals and obtain the maximum yields from them, to obtain bulls from highly productive cows raised for that purpose, and to verify all sires for offspring quality and to intensively use sires. Breeding work for obtaining highly productive animals should be conducted not only at breeding farms but at each kolkhoz and sovkhoz.

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CSO: 1824/570

LIVESTOCK

# MEASURES FOR IMPROVING HERD REPRODUCTION DISCUSSED

## Deficiences Noted

UDC 636.082.4

Moscow ZHIVOTNOVODSTVO in Russian No 10, Oct 85 pp 20-21

[Article by T. G. Dzhaparidze, general director of the All-Union Scientific Production Association for Pedigree Stockbreeding in Animal Husbandry: "To Improve Herd Reproduction"]

[Text] Acceleration of scientific and technical progress in animal husbandry is largely determined by the level of reproduction of farm animals. Intensive factors, primarily raising animals of the most highly productive breeds, extensively utilizing improver-sires in artificial insemination and mastering the embryo transplanting method in order to obtain from highly productive animals dozen of times more offspring than in ordinary reproduction, appear ever more vividly at the present stage of development of animal husbandry.

The most urgent problems of improvement in the reproduction of farm animals were examined at the all-Union conference-seminar recently held in Kazan. Speeches by managers and specialistsfrom agricultural agencies and scientists are published below.

Acceleration of scientific and technical progress in animal husbandry and this sector's intensification are based primarily on the following factors: extending the scientific principles of animal feeding; refining technologies at sections; improving herd reproduction; making selection for the development of highly productive herds; ensuring steadfast veterinary well-being.

A fundamental improvement in herd reproduction matters is one of the important potentials for an increase in the production of livestock products. Last year the country's farms obtained 81 calves, 88 lambs and 1307 piglets per 100 primary females. Calculations show that, if we had succeeded in increasing the yield of calves per 100 cows to 90 head, farms would have been able to

obtain an additional 2.7 million calves and 3.5 million tons of milk. This is quite realistic, because some republics and oblasts attain a calf yield of up to 90 head and more. For example, over a period of more than 10 years the Moldavian SSR has annually obtained 90 to 93 calves. Last year farms in Zhitomir Oblast obtained 95 calves per 100 cows, in Volyn, Crimean, Lvov and Ivano-Frankovsk oblasts, 94 and in Ulyanovsk and Kamehatka oblasts, 92.

At the same time, in Voroshilovgrad Oblast the calf yield does not exceed 80 percent annually. Farms in the Kazakh SSR, the Azerbaijan SSR, the Turkmen SSR and some RSFSR autonomous republics and oblasts have a low calf yield.

Whereas in 1984 kolkhozes and sovkhozes in the Lithuanian SSR obtained 2,207 piglets per 100 primary sows, on farms in Tambov Oblast this indicator was only 920, that is, one-half of the above.

An analysis of data and a check in the localities have shown that unsatisfactory feeding conditions, a violation of practices for keeping breeding stock and a poor preparation of females for delivery are the basic reasons for the low yield and preservation of offspring. On many farms animals are not separated into dry-period groups, often there are no delivery departments and cows calve in stockyards or other adapted barns. Section dispensaries are not used, the "vacant-occupied" principle in keeping newborn calves is violated, a complete clinical examination of breeding stock is not made and the exercise of animals is not organized.

The importance of delivery departments for the preservation of calves can be exemplified by Ulyanovsk Oblast. They are available at almost every section. Therefore, it is not accidental that the calf yield is 90 head per 100 cows. At the same time, in Tula, Kostroma, Smolensk and Ivanovo oblasts delivery departments are available only at 12 to 24 percent of the sections and the calf yield in these oblasts totals 74 to 79 head.

The calving of cows under unsanitary conditions gives rise to gynecological diseases and postpartum complications. For example, on farms in the Estonian SSR and Sverdlovsk Oblast about 20 percent of the cows are sick for these reasons and in Leningrad Oblast, 29 percent. The high morbidity of cows after calving leads to the prolongation of the service period and to passing a rut without pregnancy and, as a rule, 10 to 12 percent of the sick cows lose their reproductive capacity.

The flow-shop system of milk production and herd reproduction or its individual links are introduced at insufficient rates in some republics and oblasts. The efficiency of this system's application in dairy cattle raising is known to many. Suffice it to say that, according to the report of farm specialists using this system, the calf yield increases by 5 to 7 head and production costs are lowered by 10 to 20 percent. Moreover, the example of such oblasts as Lvov, Ivano-Frankovsk and some others convincingly confirms the advantage of the introduction of the flow-shop system.

At the same time, this advanced technology is not applied successfully everywhere. For example, farms in the Kazakh SSR and in a number of oblasts,

krays and autonomous republics in the Russian Federation transferred less than 20 percent of the breeding stock to this system.

On some farms artificial insemination has not yet found extensive application, which has a negative effect on the offspring yield. In the Kazakh SSR, the Azerbaijan SSR, the Georgian SSR and a number of oblasts in the nonchernozem zone of the RSFSR a little more than 50 percent of the cows are inseminated artificially. The inclusion of privately owned livestock in artificial insemination still remains low in many republics. This applies to the Belorussian SSR, the Kazakh SSR, the Uzbek SSR, the central nonchernozem zone, the Volga Area and other zones in the RSFSR. At the same time, there is a good example of this work in Ternopol Oblast, where 90 percent of the population's cows are inseminated free of charge, at the expense of farms.

Attention to the organization of specialized raising of young replacement stock has diminished slightly recently. This work is done in two directions, that is, intrafarm and intrasection specialization and establishment of specialized farms -- interfarm complexes. Practice shows that raising replacement heifers on specialized farms makes it possible to obtain the first calvings at the age of 25 to 27 morths. The daily milk yield from such primapara heifers exceeds that from similar heifers of the same age from nonspecialized farms by 2 to 2.5 kg. Work indicators are high on the specialized Mayak Farm in Ternopol Oblast, where 3,500 to 5,000 kg of milk are annually obtained from the primapara heifers of this complex. On the Rossiya Kolkhoz in Ivano-Frankovsk Oblast specializing in the raising of primapara heifers it has become a rule to sell them to farms with a guaranteed level of milk productivity. Unfortunately, this is not the case at all heifer raising complexes. For example, is it possible to raise a good cow in Kursk Oblast, where the average daily gain in the live weight of replacement heifers is 130 to 250 grams, and in Voronezh Oblast where it is 120 to 230 grams and in Tambov Oblast, 250 to 310 grams? As a result, milch herds in these oblasts are renewed too slowly, while up to 40 percent of the low-productivity cows are kept on farms.

Agricultural bodies in a number of republics do not pay sufficient attention to training skilled personnel in the artificial insemination of animals. In the Belorussian SSR, the Turkmen SSR and Saratov and Perm oblasts only 40 percent of the inseminating technicians have specialized education.

The problem of training personnel for animal artificial insemination, primarily technicians and gynecologists, of applying measures of moral and material incentives and of introducing the brigade contract in herd reproduction is put in the forefront. Its solution will help to increase the quantity of the obtained healthy young stock.

# Application of Science, Technology

UDC 636.082.4

Moscow ZHIVOTNOVODSTVO in Russian No 10, Oct 85 pp 24-26

[Article by A. M. Okopnyy, Ukrainian SSR deputy minister of agriculture: "We Are Improving Herd Reproduction"]

[Text] Advanced experience shows that it is possible to sharply increase the production of meat, milk and other products with well-organized herd reproduction. However, this is inconceivable without improvement in the feeding and keeping conditions of animals.

Thegreater the progress made by science in the area of feeding of farm animals, studying their needs for nutrients in various physiological states, the more obvious the quantitative and qualitative insufficiency in nutrients manifested in serious disturbances in the fertility of animals.

Therefore, it is not accidental that the Ukraine's agricultural bodies attach great importance to the establishment of a firm feed base for animal husbandry. Intensive work on the development of feed production is done in the republic. Fulfilling the overall plan for an increase in the production of feed and feed protein, kolkhozes and sovkhozes have expanded the areas sown with perennial grass, multicomponent grass-legume mixtures, fodder root crops and melon and other high-yielding crops, have begun to more widely practice repeated sowing and take measures to increase the productivity of natural fodder land, to improve the quality of fodder and to lower losses during its harvesting, transportation and storage.

In the system of measures for increasing the reproductive capacities of animals, the preservation of young stock and the productivity of livestock on the republic's kolkhozes and sovkhozes the organization of a correct feeding and keeping of animals during the pasture period is of very great importance.

The point is that the sector's industrialization makes it necessary to fundamentally reexamine the physiological capabilities of the animal organism and the limits of its adaptability to various conditions. At complexes and ordinary stall barns without pasture grazing it is impossible to ensure a good reproductive capacity of cows, heifers, sows, ewes and mares. There is only one way out—to promptly transfer livestock to summer camps. For example, in the republic during the current year 70 percent of the cattle, including 80 percent of the cows, 50 percent of the hogs and the entire sheep stock have been taken out to summer camps. This is 10 to 15 percent more than during past years.

The selection of efficient technologies of the sector's management plays a serious role in the intensification of herd reproduction. The separate group keeping of cows with due regard for their physiological state and productivity is one of the advanced directions increasing the efficiency of dairy cattle

breeding. The new technology, which is called the flow-shop system of milk production and herd reproduction, has been widely introduced on the republic's farms. It is based on intrasection specialization and shop organization of labor. The transition to the flow-shop system has contributed to an increase in the calf yield and to a more intensive utilization of stock. It includes a number of advanced zooveterinary methods: specialized raising of heifers, a clinical examination of breeding stock, a prompt insemination of animals and an efficient cow culling system.

The advantage of this system is confirmed by the practical experience of farms in Lvov, Ivano-Frankovsk, Chernovtsy, Ternopol, Volyn and Vinnitsa oblasts. Here, as a result of the strengthening of the feed base, an efficient solution of reproduction problems and a rational application of measures of material and moral incentives for service personnel, the productivity of animals rises, the production of milk and meat increases and assignments for their sale to the state are fulfilled successfully. In the oblasts named the calf yield per 100 cows increased to 91 or 94 percent. Throughout the republic new technology was introduced at 7,100 dairy sections, where 3.4 million cows were kept.

On the republic's farms in the last few years exceptionally great importance has been attached to the organization of proper conditions for raising young cattle during their first days. A total of 6,468 delivery departments with preventive clinics have been established for this purpose. The method of year-round raising of calves in individual outdoor preventive clinics was introduced on farms as of 1984. It has already been introduced on 597 kolkhozes and sovkhozes in Ternopol, Rovno, Khmelnitskiy, Cherkassy and Chernigov oblasts. A total of 14,943 individual small houses, where 42,000 calves are raised, their preservation comprising from 98 to 100 percent, have been built.

In dairy herds the decline in fertility, that is, obtaining a calf from every cow less often than once a year, leads to the failure to obtain a large quantity of milk and meat. In practice, it is possible to have a calf from every cow annually. This is confirmed by the practical experience of many advanced farms, rayons and oblasts as a whole. The efforts of specialists in the localities are directed toward shortening the length of the service period, which maximally should not exceed 60 to 65 days. Appropriate conditions—first of all, the availability of standard artificial insemination centers at sections and their equipment with stands of the physiological state of animals—are needed to perform this work.

Laboratories for pedigree stock work and herd reproduction are established on the basis of the best standard artificial insemination centers. One of the best laboratories is on the Zhovten Kolkhoz in Pereyaslav-Khmelnitskiy Rayon, Kiev Oblast. Specialists in all the republic's oblasts have become acquainted with its practical experience. More than 900 such facilities staffed with specialists with zooveterinary education function here now.

Many farms cope successfully with the task of obtaining a calf from every cow annually. More than 2,150 kolkhozes and sovkhozes obtain 95 to 100 calves per 100 cows and more. On the whole, farms in nine oblasts obtain 90 to 95 calves

per 100 cows. The offspring yield has reached 86 percent for the first time in the republic. However, these indicators do not suit us today.

As a search for new forms programs for the acceleration of scientific and technical progress in pedigree stock work and intensification of the reproduction of farm animals have been developed and are being implemented in each of the republic's 25 oblasts. These programs include the system of herd reproduction and control of infertility in breeding stock. Specific dates and individuals responsible for its fulfillment have been assigned. In every oblast the basic rayon is approved in accordance with the decision of the council of the oblast agroindustrial association.

A total of 22,800 technicians in artificial insemination ensure herd reproduction on kolkhozes and sovkhozes. Along with the annual retraining and certification of this personnel, for the purpose of improving their occupational skills, contests among technicians in artificial insemination have been held in rayons and oblasts in the last few years. This work is well organized in Lvov, Dnepropetrovsk and Ternopol oblasts.

Refinement in zootechnical recording at sections and the introduction of the posts of veterinary gynecologists, who should systematically carry out a clinical examination of the milch herd, into the list of the authorized staff at large dairy sections and complexes will contribute to an improvement in the state of affairs in reproduction. Biochemical laboratories, where the quality of feed, as well as the biochemical and physiological indicators of the state of health of cows, is controlled, especially during the last period of their pregnancy, are established at many sections. For the purpose of preventing diseases connected with the common cold in calves during their transportation in winter to specialized farms, specialists have proposed methods of heating transport facilities.

Solar insolation and active exercise play an important role in increasing the intensity of utilization of breeding stock through the stimulation of rut heat in animals. Experiments have established that sections, where exercise is provided to animals only in a pen, obtain 14 percent fewer calves than sections where animals enjoy active exercise. Active outings of animals at a distance of 5 to 6 km with a subsequent stay in a pen during the second half of the day have proved to be especially effective during the stabling period.

It must be admitted that individual managers and specialists of kolkhozes and sovkhozes, as a rule, lagging ones, violate the established procedure of work withherds and leave old cows unsuitable for reproduction at the beginning of the year, delivering them for slaughtering during the first quarter. In order to study the reasons for the lag and to map out ways of overcoming it, the Ministry of Agriculture organized group conferences with the managers of all lagging farms, at which, in addition to an analysis of the state of affairs, chairmen and directors of advanced kolkhozes and sovkhozes shared their practical experience.

An improvement in the reproduction and an increase in the productivity of animals largely depend on the organization of replacement heifer raising. An analysis of the work of pedigree stock plants and sovkhozes showed that, where

the average daily increase in the live weight of heifers was at the level of up to 400 grams, the productivity of animals during the first lactation did not exceed 2,500 kg of milk. However, on farms, where an average daily increase of 550 to 650 grams was ensured, the productivity of primapara heifers was 3,500 to 4,000 kg. Agricultural agencies have established control over heifer raising work on specialized farms. Measures are also being taken to establish specialized heifer raising sections on every dairy farm.

The flow system of output in hog breeding continues to be introduced. To date it has been mastered at 1,500 sections with a stock of 6 million hogs.

Here principal attention is concentrated on increasing the efficiency of utilization of breeding stock, primarily by shortening the reproductive cycle and improving the feeding and keeping of young stock with a view to obtaining a live weight of 34 to 35 kg in 4-month old piglets. The volumes of production of starter mixed feed with the utilization of the available resources of barley, oats, pulse crops and meat-bone meal are expanding at interkolkhoz mixed feed plants.

Realizing the importance and role of artificial insemination in the development of hog breeding, 12 specialized enterprises are being established in the republic. This will make it possible to increase the number of artificially inseminated sows to more than 1 million. Work on reproducing hybrid and crossbred piglets, evaluating boars according to the quality of offspring and inseminating sows with the sperm of improvers is expanding.

The high fertility of sheep is one of the economically useful criteria, which accelerates herd reproduction and increases the sector's marketability and income. However, there are still many problems in our sheep breeding. They include the need to augment the stock population by organizing an efficient herd reproduction, primarily raising the share of ewes in the herd and inseminating them with the sperm of improver-rams, increase in the yield and preservation of lambs, introduction of advanced labor organization at sheep breeding sections, provision of the constancy of personnel and solution of other no less serious problems.

Problems of reproduction in horse breeding are solved in a complex manner. In the last few years it has been possible to stop the decrease in the number of horses. Many farms have ensured an increase in stock. The colt offspring, although not high, is growing every year, the number of pedigree stock sections is increasing, the artificial insemination of colts is being introduced and measures are being taken to raise the level of operation of stud farms and hippodromes.

In the republic work on embryo transplantation is done at the Ukrainian Scientific Research Institute of Breeding and Artificial Insemination of Cattle, at the Scientific Research Institute of Animal Husbandry in the Forest Steppe and Polesye of the Ukrainian SSR and at the Ukrainian Scientific Research Institute of Physiology and Biochemistry of Farm Animals. A special production laboratory has been organized at the Lvov Oblast Pedigree Stock Association. Work on transplantation is done on the experimental farms of institutes, as well as on a number of kolkhozes and sovkhozes.

Specialists of kolkhozes, sovkhozes and administrations of agriculture try to intensively utilize breeding stock and to introduce the achievements of science and advanced experience in herd reproduction matters into practice.

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11439

CSO: 1824/91

# LIVESTOCK

# RAISING QUALITY REPLACEMENT STOCK IN BSSR

Minsk SELSKAYA GAZETA in Russian 29 Oct 85 p 2

LArticle by A. Golubitskiy, deputy director of science at the Belorussian Scientific Research Institute of Animal Husbandry, K. Borisovets, head of a department, professor, and V. Kazakevich, senior scientific associate: "What Hinders Reproduction"]

[Text] With biologically high-grade feeding and appropriate keeping conditions during all raising periods animals grow normally and reach the optimum live weight, line sizes and typicalness characteristic of a specific breed. At the same time, weight characterizes to a significant extent the general development of both young replacement stock and milking cows. Numerous investigations have established a close interconnection between it and the productivity and reproductive functions of cows. Whereas a cow weighing 400 kg with high-grade feeding can give 2.1 to 2.3 kg of milk per quintal of live weight in 24 hours, an animal weighing 500 kg can give about 3 kg, or 1.5 times as much.

On the overwhelming majority of the republic's kolkhozes and sovkhozes the live weight of cows still remains low. This can be judged from the indicators of such animals culled for meat. Their average weight is 415 to 421 kg.

The effect of the high weight of cows on their productivity and offspring yield is well exemplified by two oblasts. In the last 2 years the live weight of cows dropping out of the basic herd in Grodno Oblast totaled 443 to 447 kg and in Mogilev Oblast, 397 to 403 kg. Therefore, the milk yield was 2,644 to 2,735 and 2,045 to 2,142 kg respectively. This factor also has its effect on the offspring yield. During the indicated period 86 and 89 calves per 100 cows and heifers were obtained in the first case and 80 and 81, in the second.

Such a significant difference in the productivity of cows and offspring yield is due primarily to the different approach to the organization of herd reproduction and raising of replacement stock. An average daily weight gain of 421 and 431 grams per heifer was obtained on kolkhozes and sovkhozes in Grodno Oblast and 328 and 367 grams, in Mogilev Oblast. Although in the same Grodno Oblast the average daily weight gain of 130 to 150 grams in young replacement stock was below the optimum level for commodity farms, this too

had a significant effect on the weight of primapara heifers and full-grown cows and, ultimately, on their productivity.

Under the conditions of the dairy complex it was established experimentally that normally raised primapara heifers weighing up to 474 kg with a well organized increase in the milk yield gave during lactation 4,056 kg of milk with expenditures of 101 feed units and production costs of 18.9 rubles per its quintal. Bigger cows are noted for a better capacity for eating and digesting a large quantity of feed and a more stable productivity. As a rule, the live weight of cows record breaking in the milk yield is higher than the average in the herd. However, the animals with the most milk usually are not the biggest in the herd and, conversely, the biggest cows do not always have abundant milk. Much depends on the milking capacity of breeds.

Every breed of livestock has its optimum live weight and, when it is increased further, the milk yields of cows do not only increase, but also decrease. Therefore, pedigree stock farms must have milk yields within the limits of 800 to 1,000 kg per 100 kg of the live weight of cows and commodity farms, 600 to 800 kg. The coefficient of milkiness must be used carefully in the determination of the desirable weight of a cow. However, an incorrect conclusion, that is, the smaller the cow, the more profitable it is, must not be drawn. The optimum live weight of cows on farms of different specializations ensuring the maximum milk productivity with the greatest economic efficiency must be determined for every breed on the basis of an analysis of the best herds. For pedigree stock farms such a weight of cows of the black-and-white breed in the first calving should be 450 to 500 kg, in the second, 500 to 550 kg and in the third, 550 to 600 kg; for commodity farms in the first calving, 425 to 450 kg, in the second, 450 to 500 kg and in the third, 500 to 550 kg respectively.

A correct raising of young replacement stock is of great importance in all this. Specialized heifer farms have been organized in the republic. An analysis of herd classification shows that primapara heifers coming from such farms have a better development and a higher potential of milk productivity and in milk yields surpass their contemporaries raised directly on kolkhozes and sovkhozes by 200 to 230 kg. The Kolkhoz imeni Kirov in Vitebskiy Rayon, the Krasnyy Oktyabr Kolkhoz in Dobrushskiy Rayon and others supply good heifers. For example, the Kolkhoz imeni Kirov annually sells 1,400 to 1,500 heifers at the age of 22 to 26 months, whose live weight is 420 to 430 kg, to farms in Vitebskiy Rayon. In its own milk herd replenished by such primapara heifers the average milk yield totaled 4,547 kg last year and on the Kolkhoz imeni Krasnaya Armiya, more than 4,000 kg.

However, most specialized farms have not yet reached the technological standards in the quantity and quality of the raised heifers. On all specialized farms during the year before last the average daily weight gain was 397 grams as compared to 570 grams envisaged by technology. On such kolkhozes as the Zvezda Kolkhoz in Vitebskiy Rayon, the 20 Syezd KPSS Kolkhoz in Beshenkovichskiy Rayon, the Kolkhoz imeni Dzerzhinskiy in Polotskiy Rayon, the 50 Let VLKSM Sovkhoz in Gorodokskiy Rayon and the Osovets Sovkhoz in Mozyrskiy Rayon this indicator does not exceed even 300 grams.

Owing to a lag in development, on most specialized farms heifers are inseminated when they are over the age of 22 months, weighing 310 to 320 kg. On the Kolkhoz imeni Lenin in Krasnopolskiy Rayon, the Krasnaya Zvezda Kolkhoz in Mogilevskiy Rayon and the Vostok Sovkhoz in Bykhovskiy Rayon heifers are inseminated at the age of 24 months and more, weighing only 300 to 310 kg. On the Kolkhoz imeni Kirov in Miorskiy Rayon, the Kolkhoz imeni Engels in Tolochinskiy Rayon and the 50 Let VLKSM Sovkhoz in Gorodokskiy Rayon the situation is even worse. Heifers are sold at the age of 30 to 32 months, weighing 340 to 350 kg. The low provision with feed and poor care are the reasons for the lags in the development of heifers and in the attainment of the planned capacity by complexes.

Work on the establishment of specialized sections for raising and increasing the milk yield of primapara heifers on every farm (not forming part of an association) is now being done in the republic. Volkovysskiy Rayon is the initiator of this. There are now 39 such sections, 14 control cowhouses and 11 control groups for checking the productivity of primapara heifers. Young replacement stock is raised under conditions making it possible to obtain average daily weight gains of 500 to 600 grams. On many farms milk yields of primapara heifers rose from 2,600 to 3,000 kg annually.

Cooperation between the Kolkhoz imeni Kirov and the Kolkhoz imeni Krasnaya Armiya in Vitebskiy Rayon can serve as a graphic example of the correct organization of the raising of young replacement stock and its subsequent utilization at the dairy complex. In 10 years the Kolkhoz imeni Krasnaya Armiya has renewed its herd three times. With the loose box keeping and normed feeding of cows this farm maintains an annual milk yield in the herd at the level of 4,000 kg per cow and more. Heifers 24 months old and 6 or 7 months pregnant, whose live weight is 420 to 430 kg, are received from the Kolkhoz imeni Kirov, whereas, on the average, heifers 27 to 28 months old, weighing 370 kg, are received from the republic's specialized farms. The average live weight of a full-grown cow of the black-and-white breed on the Kolkhoz imeni Krasnaya Armiya is 490 kg.

A disruption in the optimum periods of raising young replacement stock along with a considerable deficiency in dairy products and offspring involves a big overexpenditure of monetary and material resources and lowers the rate of turnover and efficiency of stock. In other words, this is not such a harmless fact as may seem at first glance. Let us take the Rassvet Kolkhoz in Svetlogorskiy Rayon. An average daily weight gain of 337 to 350 grams in young replacement stock is obtained here. This means that a heifer 6 or 7 months pregnant, weighing 420 kg, should be raised during 38.4 months, or 14.4 months longer than the period envisaged by technology.

Underdeveloped young stock cannot qualitatively improve the basic dairy herd. A productivity of primapara heifers lower than 70 percent of the average milk yield in the herd does not have a positive effect on the gross increase in milk. Therefore, we must strive to raise high-grade young replacement stock and to increase the live weight of cows.

11439 CSO: 1824/86

#### LIVESTOCK

# HALF YEAR REVIEW OF UKRAINIAN MEAT, MILK PRODUCTION

Kiev RADYANSKA UKRAINA in Ukrainian 14 Aug 85 p 1

[Article under rubric "Economic Review": "The Start of Another Half Year: High Culture, High Productivity for Farms and Complexes." Text in all caps shown in boldface in source]

[Text] The following is a summary of the work done by livestock breeders over a seven-month period. Statistical data has shown a positive result: IN COM-PARISON WITH LAST YEAR, THE PRODUCTION OF MEAT (BEEF, POULTRY, RABBIT) INCREAS-ED BY 150,600 TONS; MILK PRODUCTION INCREASED BY 126,000 TONS; EGG PRODUCTION-BY 177.1 MILLION EGGS. A large part of the increase in production can be attributed to the period in which cattle were being raised under summer-camp type of conditions and were being fed green fodder. On many of the farms, rayons and oblasts workers skillfully managed to utilize favorable conditions to their advantage and thereby were able to achieve the increase in meat production. July starts the second half year of the concluding year of the 5-year plan. It becomes extremely important not only to maintain this kind of progress but to develop it even further. This should be a common, joint effort on the part of all livestock breeders throughout the entire republic. If we take a look at each individual oblast, we find that a number of them are lagging behind. We need to eradicate this problem and make up for lost time. Let's look more specifically at the present status of oblasts for the upcoming half year.

MEAT. Meat production increased for all oblasts, but especially for the following: Nikolayev and Chernovtsy (13 percent); Dnepropetrovs (12 percent); Zhitomir, Ivano-Frankovs, Odessa, Rovno, and Ternopol (10 percent). Let's note, however, that in some instances the increase in meat production was not due on account of intensive factors, that is, as the result of an increase in average daily growth of the weight of the animals, thus raising their market conditions. We've already analyzed in previous reviews the indexes for the winter-stall period; in some cases there is a substantial difference. According to specialists one of the main reasons for the difference is the fact of poor feeding habits. Now, let's take a look at the daily increase in weight for only one summer-month--July, when feed for the livestock was in abundance throughout all zones. In the raising of large horned cattle, here again, the results of cultivation vary widely (average daily weight increase in grams):

## LEADING OBLASTS

Cherkassy	665
Chernigov	626
Volyn	610

#### LAGGING

Dnepropetrovsk	415
Kirovograd	419
Zaporozhye	431
Transcarpathian	433

We should take great pleasure in the fact that the situation in the Chernigov Oblast has improved considerably, which in the past had been criticized repeatedly for low weight increase. Evidently, the right conclusions were The breeders managed to put into effect intensive cultivation based on the feeding of green fodder. At the same time, and for no other reason but poor management, the weight increase remained essentially the same for winter as for summer. The same can be said about the raising of hogs. In July the Ivano-Frankovsk Oblast showed an average daily weight increase of 474 grams per hog. In the Voroshilovgrad Oblast the weight increase was 350 grams; in the Kiev Oblast, 354 grams. On the farms of the Kirovograd, Poltava, Nikolayev, and Sumy Oblasts, the weight increase did not exceed 209-239 grams. In oblasts where there is a lag, the weight increase for cattle and hogs is a third lower than in the leading oblasts. We must operatively learn better methods of breeding and see to it that these methods are disseminated everywhere in an effort to remove the lag. With better methods and experience meat production is bound to increase.

MILK PRODUCTION. We are reminded that on the 1st of May, before milk cows have gone out to pasture, the gross output of milk for the republic was 29,100 tons less than on the same date a year ago. Milk production increased in 14 oblasts, especially in the Sumy Oblast (9 percent); Volyn, Transcarpathian, and Kharkov Oblasts (6 percent). There was a decrease in 11 of the oblasts, especially in the Kherson Oblast (5 percent); Zaporozhye (3); Crimea (2); Voroshilovgrad, Donetsk, and Khmelnitskiy (1 percent).

The average milk output per cow for January-July, as compared to the same period for last year, increased throughout the republic by 36 kilograms and on the 1st of August had reached 1,616 kilograms. Who is ahead and who lags behind? We present the following figures for milk output per cow for the beginning of the year (in kilograms):

# LEADING OBLASTS

Lvov	1,933
Chernovtsy	1,899

#### LAGGING BEHIND

Chernigov	1,354
Voroshilovgrad	1,454

Milk production for the month of July in the majority of the oblasts continued to rise. But in the Kirovograd and Zaporozhye Oblasts there was a decrease as compared with last year. The reason given was that frequent rains made it impossible to provide uninterrupted feeding. Come now--didn't it rain in neighboring parts, too? So it is that some look for ways to overcome these obstacles, and others look for a way to justify things.

We begin another half year. TO INSURE A SUCCESSFUL FINISH, WE MUST SEE TO IT THAT OUR WORK TODAY WILL BRING MORE RESULTS THAN YESTERDAY AND THAT TOMORROW WILL BE MORE PRODUCTIVE THAN TODAY. AT PRESENT THERE IS AN ADEQUATE SUPPLY OF FEED EVERYWHERE. EVERYTHING DEPENDS ON ORGANIZATION, DISCIPLINE AND MANAGEMENT IN THE FARMS.

13006/12712 CSO: 1811/62

## REGIONAL DEVELOPMENT

TIMERYAZEV AGRICULTURAL ACADEMY MEETING; NIKONOV SPEAKS

PMO61626 Moscow PRAVDA in Russian 5 Nov 85 First Edition p 2

[TASS report: "Science--A Catalyst of Progress in the Agroindustrial Sector"]

[Text] The fulfillment of the USSR Food Program and the successes of the country's agriculture depend to a considerable extent on cadres and their competence and initiative. Today they are facing particularly high demands: under the conditions of the economy's intensification the agroindustrial complex needs specialists providing an organic combination of professional knowledge, political maturity, and organizational talent. An important role in their training has been assigned to higher education. This was said at today's [as published] report and election conference at Moscow's K.A. Timiryazev Agricultural Academy. V.P. Nikonov, secretary of the CPSU Central Committee, took part in its work.

The documents of vast political importance which have been published in the press--the drafts of the new edition of the party program and of the CPSU statutes--created at the conference an atmosphere that was creative and businesslike in the party fashion. It was emphasized in the report and speeches that these documents have become a precise guideline for the academy's collective, in line with which it is checking the results of its labor and building its plans for the future. The main task of the Timiryazev collective is to make a fitting contribution to the implementation of the program for the country's socioeconomic development which has been mapped out by the party. It was noted that a major restructuring of all work has begun in the academy in the light of the new demands. New laboratories have been set up for promising avenues of agricultural science. Specialized courses have been introduced for the study of collective contracts and the economic foundations of the agroindustrial complex, and lecturers are enhancing their skills in the spheres of computer technology and automated control systems. The methods required for intensive technology are now being studied under new curriculums.

The speakers at the conference who focused their main attention on ways to improve the instructional and scientific process at the academy included party committee secretary V.V. Isayevich; assistant lecturers O.I. Kiryushin and K.A. Borin; V.K. Menkin, dean of the veterinary engineering [zooinzhenernyy]

faculty; academician G.I. Tarakanov, head of the vegetable growing department at the V.I. Lenin All-Union Academy of Agricultural Sciences; academician M.I. Sinyukov, dean of the V.I. Lenin All-Union Academy of Agricultural Sciences. Much has been done, the speakers said, but there is no time to waste, it is necessary to go further and achieve more. The plans must provide for the study of the latest achievements of scientific and technical progress in horticulture and stockraising and must combine more fully the theoretical and practical training of graduates. It was stressed at the conference that science must become a real catalyst for the acceleration of progress in agricultural production.

The conference was addressed by V.P. Nikonov.

The academy's party conference, he said, is being held at a time when the party and the entire Soviet people are actively preparing for the 27th CPSU Congress, taking effective measures to complete the current year and the 5-year plan as a whole, and widely discussing the plans for the country's long-term economic and social development.

The drafts of the new edition of the CPSU Program and CPSU statutes, which have been published for broad discussion, are documents of enormous theoretical and political significance and are the result of the scientific generalization of the experience of all generations of communists and Soviet people. Based on the firm foundation of Marxism-Leninism and realistic analysis of the country's domestic and international situation, the draft new edition of the program provides an accurate and detailed description of the strategic directions of the work of the party, the soviet state, and the entire people.

The implementation of tasks set for the 12th 5-Year Plan and for the period through the year 2000, the fulfillment of the USSR Food Program, and the acceleration of scientific and technical progress in the agrarian sector depend on the availability of specialists for agricultural enterprises and the stability of leadership cadres.

The Moscow Agricultural Academy makes a considerable contribution to the training of cadres. Unfortunately, a gap still exists in the academy, just as in many other VUZ's, between modern demands on the training of specialists and the quality of the knowledge acquired by students. Many agricultural VUZ's offer inadequate training of specialists in the introduction of intensive technologies for the cultivation of agricultural crops and the production of livestock products, soil-protecting systems of crop farming, and modern methods for the organization and management of production on the basis of collective contract principles.

There is a need for improvements in teaching on the basis of the latest pedagogical methods. It is necessary to recruit specialists with particularly good records from kolkhozes, sovkhozes, and scientific institutions to give lectures and conduct classes and to ensure a speedy transition to complete computerization of the entire instructional process and the training of teachers and students in management systems involving the use of computers.

The main task in the instructional sphere is to ensure that the academy's graduates have a perfect mastery of the most modern technologies for the rearing of high-standard plants and agricultural animals. Here it is of essential importance to ensure that young specialists know not only how things must be done but also why they must be done in this way. It, therefore, follows that they must acquire thorough theoretical knowledge and sound skills in its application.

V.P. Nikonov noted that systematic work to improve the structure of scientific teaching cadres is a most important factor for improving all higher education activity. Positive qualitative changes have occurred in this direction recently. Nevertheless, despite the generally favorable cadre situation, VUZ's are still experiencing a shortage of doctors and candidates of sciences in general education departments who would impart basic knowledge to future specialists and would shape them into bearers of lofty culture and of everything that is new and progressive in the life of the modern countryside.

The training of scientific teaching cadres must be aimed at the profound study of the theoretical, methodological, and practical issues and problems raised at any given time by production.

An important role in the organization and implementation of students' practical training, the speaker said, is played by teaching and experimental farms. There are, however, substantial shortcomings in the work of many such farms. Matters must be organized so that these farms become the basic laboratories for the introduction of the achievements of science and advanced experience. The teaching and experimental farm must mold the future specialist's professional skills. There is no place here for outdated methods and forms of labor organization or for low standards of production. Unfortunately, all these are still encountered, and quite often at that, even in such a leading educational establishment as the Timiryazev Academy.

The USSR Ministry of Agriculture All-Union Higher School for Agroindustrial Complex Management, which operates on the basis of the academy, is called upon to play a major role in cadre policy. It is tasked with coordinating scientific research and methodological work, seeking new and more efficient methods and forms of post-VUZ education, and enhancing its fruitfulness.

Our party's Central Committee, V.P. Nikonov went on, attaches great significance to the development of VUZ science and also to the fuller utilization of its scientific potential and skilled cadres in solving the most important scientific, technical, social, and economic problems.

Analysis has shown that not enough major comprehensive research is carried out in VUZ's, while the results of completed research is only slowly introduced in practice and inadequate use is made of the base of teaching farms for the verification in production of new developments.

The newly elected party committee must enhance the responsibility of leaders and of the professorial and teaching staff for the effectiveness, innovative nature, and quality of scientific research that is carried out and for the training of scientific cadres.

In conclusion, the secretary of the CPSU Central Committee expressed confidence that the communists and the entire collective of the Moscow Agricultural Academy will devote their energy, experience, and knowledge to the honorable work of training highly skilled cadres and successfully conducting research for the purpose of accelerating scientific and technical progress and implementing the USSR Food Program.

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CSO: 1824/129

#### AGRO-ECONOMICS AND ORGANIZATION

IZVESTIYA ROUNDTABLE EXAMINES RAPO OPERATIONS, POTENTIAL

Moscow IZVESTIYA in Russian 3 Jun 85 p 2

[Article by special correspondents M. Ovcharov and O. Pavlov: "What Is the RAPO Capability?" "Agro-Industrial Workers Conduct a Round Table Discussion with IZVESTIYA's Editorial Board"]

/Text/ During the April (1985) Plenum of the CPSU Central Committee, emphasis was placed upon the need for intensifying the work concerned with implementing the Food Program and achieving more efficient use of the potential created for the APK <u>/agroindustrial complex</u>/. Here a great deal depends upon the new organs of administration -- agroindustrial associations. They have been in existence for more than 2 years. This period is considered to be adequate for analyzing the work carried out, isolating the bottlenecks and outlining specific measures for intensifying production operations. However, by no means are the agroindustrial associations in all areas justifying the hopes placed in them. What are the RAPO /rayon agroindustrial association/ capabilities and what is hindering them? What is paralyzing their initiative and efficiency and what is affecting their operational style? This was the subject of a discussion at the IZVESTIYA roundtable.

#### Tale About a Red Bull

N. Logach, chairman of the council for the Yershovskiy RAPO in Saratov Oblast: The council of our RAPO, since the very beginning, has called for the unconditional carrying out of all contractual obligations among partners. The channels for additions were closed and illegally obtained amounts were returned to the farms. At the same time, we proved that money and good amounts of it can be earned in all branches of the agricultural service. Thus, Selkhoztekhnika has undertaken the assembly and adjustment of new machines and mechanisms and their delivery to the farms.

Correspondent: When one visits the various areas and holds discussions with the specialists of agroindustrial associations, he becomes convinced that the RAPO's are accomplishing a great deal in connection with high final results being achieved at the kolkhozes and sovkhozes and throughout the entire agricultural industry. But another fact is also apparent: yes, there have been successes and yet considerably more unresolved problems still remain.

N. Logach: This is truly so. There is a paradox: the more products we obtain, the more difficult it is to sell them without losses. Our Yershovskiy Rayon is located 200 kilometers from the Engels Meat Combine and some farms are as many as 300 kilometers distant. The young bulls are loaded during one 24 hour period and for another 24 hour period they are shaken up in the bodies of motor vehicles and in tractor trailers. Subsequently, they stand waiting for several days at a time, unfed and unwatered, at the gates to the combine. Here they quite understandably lose weight. At each livestock farm, 20-30 kilograms of meat are lost. Is this amount large or small? Judge for yourself. Indeed, we sell 17,000 young bulls alone each year. Yes and 35,000-40,000 sheep and 30,000 hogs.

Thus we decided to build in the rayon, using money from the farms, a meat combine for 10 tons of meat and 1 ton of sausage per shift. The kolkhozes and sovkhozes even agreed to turn it over subsequently to the RSFSR Minmyasomolprom /Ministry of the Meat and Dairy Industry.] What can be done if the department does not wish to build processing enterprises at its own expense in remote areas? The kolkhozes and sovkhozes will suffer most from this. And not only owing to product losses. For example, a run by a Kirovets tractor at the meat combine costs approximately 800 rubles. It carries 16 young bulls. The value for two of them covers the transport expenses. Over a year's time, these expenses amount to 140,000 rubles.

Correspondent: And does this continue?

N. Logach: In no way. The combine building is a modern one and it was erected in the standard manner. But it is empty. RSFSR Minmyasomolprom did not provide any equipment for it, despite the fact that the rayon's farms agreed to pay for such equipment.

Correspondent: It turns out that the RAPO council could not find any common language with Minmyasomolprom. But there was still the council of the oblast agroprom /agricultural industry/.

A. Obrazkov, deputy chief of the Saratov Oblast Agricultural Administration for APK matters: to its deep regret, the oblast was unable to set this work in motion. Only the farmers are undertaking to build an enterprise for the processing of products and they are being instructed: do not build in this manner and do not use that design. So it turns out that you are not pleased. Do it yourself, place the processing effort in the vicinity of the raw material production area and purchase the products directly at the kolkhozes and sovkhozes. And the departmental wagon is now there. It is a tale about a white, or more accurately, a red young bull.

Correspondent: What is the solution?

- G. Zinchenko, chairman of the council for the Salskiy RAPO in Rostov Oblast: It was mentioned during the April Plenum of the Central Committee -- to administer the agroindustrial complex as a single whole.
- A. Iyevlev, Deputy Minister of Agriculture for the USSR: However, production can be administered only if the appropriate amounts of money, material resources

and contractual work limits are available. We will be sincere to the end: if a particular ministry is deprived of the opportunity of handling material resources and capital investments, then a question arises: why do we need such a ministry?

# Dispute Concerning Additions

- V. Rodnov, director of the Znamya Oktyabrya Sovkhoz in Moscow Oblast: the discussion concerning funds, or more exactly who should be in charge of them, should be continued. Let us take today's system for the servicing of milking units by Selkhoztekhnika. This work is extremely illusory. The appearance is created that the units are being serviced, but actually it is a matter of deficit spare parts being sold to us at inflated prices. We reluctantly proceed in this direction: the funds are not in our hands. If today our Selkhoztekhnika in Podolsk was closed down and only a trade organization remained, for example Selkhozsnab, we could only rejoice.
- A. Obrazkov: At the Zarya Kommunizma Kolkhoz, Selkhoztekhnika carried out the technical servicing of a milking unit at a cost of 49 rubles. But later certain repair operations were added to this amount and a number of defects corrected. Following all of the additions, the payment for the technical servicing of the milking unit was raised from 49 rubles to 1,278 rubles. Was this not an addition? Is it not somewhat reminiscent of cost accounting?
- V. Shvydko, 1st deputy chairman of Goskomselkhoztekhnika: Agreed, these are precisely the cost accounting relationships that are needed within the agricultural industry. But if we are discussing additions, then we must combat them. Nevertheless, they continue to exist. The kolkhozes and sovkhozes are guilty in this regard. They sign ridiculous papers and do not display any high principles. Meanwhile, the RAPO Council has been authorized to create any committee for the purpose of carrying out any type of inspection.
- G. Zinchenko: Is a committee to be created for each investment? When will there be time for work?
- A. Obrazkov: It is not always necessary to carry out a check -- the addition is apparent to the untrained eye. Look at what happened at the Novaya Zhizn Kolkhoz on 17 December of last year. Four fitters arrived from the Novobussarskaya Selkhoztekhnika; they rummaged about on the farm for a bit and then they departed for home. And the record of their work revealed that each of them had worked 93 and a half hours on that day on the farm. There can be no doubt but that the management of the kolkhoz and its economic service were guilty of mismanagement, having signed off on a fantastic report.
- V. Shvydko: They should be punished for this!
- A. Obrazkov: Correct. We have already punished many farm workers in a strict manner and in the future we will punish others for similar acts. But it must not be forgotten that Selkhoztekhnika has its own economic service and its own bookkeepers. It would be interesting to learn what they have been doing. Why is it that all of the additions are detected only by farmers? Is it possible that Selkhoztekhnika does not see them? I believe there must be another

explanation. Selkhoztekhnika does not wish to see this! And the authority of RAPO suffers. The word from the farms is that it is protecting our interests very poorly.

- N. Logach: It seems to me that the question must be posed in the following manner: the kolkhoz paid Selkhoztekhnika for the repair of the tractor. Selkhoztekhnika must guarantee so many hours of motor operation. And the kolkhoz requires no more information. If the tractor breaks down earlier than the schedule calls for -- a trip is made to the kolkhoz where the work is carried out free of charge. And no papers are needed.
- A. Polkovníkov, manager of the Bronnitskiy rayselkhoztekhnika in Moscow Oblast: This thought pleases me. Actually, is it necessary to prepare so many papers or to define the work regulations? The final product is needed -- a working machine out on a field or at a farm. This is where our responsibility lies.
- I. Ikhno, chairman of the council for the Berdyanskiy RAPO in Laporozhye Oblast: It is possible that one should proceed even further. We are presently introducing the contract method into operations on an extensive scale. We are telling the personnel: here is your land, equipment and fertilizer. Gather in your crops, sell them and divide up the money earned and saved. But why must Selkhoztekhnika or Selkhozkhimiya depart from this?
- A. Lysenko, director of the Salskiy Sovkhoz in Rostov Oblast: Thus there would be no disputes concerning additions.
- V. Shvydko: We are well aware of the shortcomings in our work. But nevertheless I wish to state to all those in attendance that we are not guilty in all instances. Let us think about this for a moment: upon what is the working efficiency of the machines and mechanisms primarily dependent upon? Upon their quality and reliability. Unfortunately, there are still many machines being taken from the assembly lines which do not meet the modern requirements. I will cite just one example: approximately 40 percent of the equipment does not meet the requirements for reliability. The plants are located at some distance from the farms and we are near at hand and thus we receive all of the complaints.
- A. Lysenko: Why do you order equipment that is not needed?
- V. Shvydko: I agree that there are many miscalculations. The very system of placing orders is imperfect. At the present time, for example, the farms do not wish to purchase a number of machines, despite the fact that they ordered them. They accept the machines and do not pay for them. We suffer. Our economic relationships with industry on the one hand and with the rural areas on the other are in need of radical improvements. And invariably these improvements must be carried out on a high inter-departmental level.

Correspondent: This is interesting and yet why is it that they do not pay?

A. Lysenko: I can answer this question surely. Selkhoztekhnika is accumulating unmarketable machines. They are expensive. The supplies of such machines are warping the economy of Selkhoztekhnika and adversely affecting

its accounting indicators. Thus it proposes to the farm: take and pay later. Either you can use this machine out on the fields or you can dismantle it for spare parts.

Great Harm and Light Support

Correspondent: Our discussion concerns the need for improving economic relationships and administration in the agroindustrial associations. What can a RAPO do today in this respect? Or its council? There are examples of rayon and oblast agroindustrial units, after reinforcing their decisions with weighty arguments, proceeding to change the structure of their sowings and herd.

IZVESTIYA recently published a discussion of how in Nikolayev Oblast, over the past 4 years, a reduction of 10 percent took place in the milking herd as a result of weeding out low productivity cows. They began to obtain more milk and last year the highest average milk yield per cow was obtained. Moreover, having eliminated so many "extra mouths to feed," a savings of approximately 14 million rubles was realized, the amount required for their maintenance. Many other facts associated with interesting decisions could be cited, all of which were based upon the desire to manage in an intensive, independent and responsible manner.

- G. Zinchenko: Not all of the RAPO leaders and specialists are so energetic and bold. In principle, we can accomplish a great deal. But only in those areas where the work is concerned directly with agriculture. The situation is worse with regard to coordinating the work of the farmers' partners. It would seem that all matters would have been thought out during a meeting of the RAPO council and that the necessary corrections to the plans would have been introduced and contractual obligations approved. And that now it was only necessary to carry out the work. But no! Time passes and from above they begin to interfere in these plans and shred them. Let us assume that we approved the operational plan for Selkhoztekhnika -- so many repairs, so much profit and so many types of technical servicing -- we are authorized to do this. But later oblselkhoztekhnika begins to apply its own corrections. We go there: "What are you doing?" The reply: "The plan for the oblast was corrected at the center and thus we are doing nothing."
- V. Shvydko: You are correct, such is in fact happening. But Minfin /Ministry of Finances/ is introducing changes to the plans for us. Imagine the situation: the RAPO approves one profit for our subunits and Minfin -- another and certainly higher one. We also suffer from this. At the present time, our workers have forgotten about bonuses.
- V. Rodnov: If it happened in this manner, then perhaps there are no guilty parties. And indeed there is truly some shuffling with the planning. The ministries plan and the RAPO remains silent. Later the oblast delivers its plans to the rayon -- again the RAPO turns away. Finally the RAPO composes its own plans. In all, there are three plans and they are all different.
- I. Ikhno: At the sites, it is all very clear to us what must be done and how. Why then are all these regulations necessary? During the May (1982) Plenum of the party's Central Committee, this was discussed rather clearly: to

raise the economic independence of the kolkhozes and sovkhozes. Just as in the past, on many levels no attempt is being made to solve this problem for us.

V. Shtanov, 1st deputy chief of the Main Administration for the APK of the USSR Ministry of Agriculture: this conflicts directly with the statute concerning RAPO's and all of the other normative documents. Indeed, all work by the farmers' partners must be based only upon the demands of the kolkhozes and sovkhozes. This requires a fight at times and a display of persistence and firmness. A requirement also exists for mastering the normative documents to perfection and for utilizing them fully. Cost accounting is unthinkable if this is not done and particularly in the absence of well organized economic work by the legal service. This is also a matter for some thought by the RAPO's. These services are still weak and possess little authority.

A. Obrazkov: I am absolutely in agreement with this. It happens that the RAPO leaders at times display astonishing legal helplessness and a poor knowledge of their rights and obligations. Nevertheless, it is noted that at times even thorough knowledge of the normative documents is of little assistance. Let us assume that in the middle of the year the RAPO council (and this is its right) decided to reduce the amount of repair work or the volume of technical servicing — thus both the plan and the contractual obligations must automatically be changed. And it turns out that oblsekhoztekhnika tells raysekhoztekhnika that it knows nothing about a change in plans. This is wrong. Flexibility is needed in the interrelationships of partners within the APK framework — both horizontally and vertically.

A. Iyevlev: Beyond any doubt, improvements are required in the system of economic relationships among partners in the agricultural industry and in the future this work must be carried out in a more intensive manner. And the need for learning how to utilize effectively those rights already possessed by the RAPO's is even more important today.

Thus I visited the Petrovskiy RAPO in Stavropol Kray. The workers had all assembled. I posed a question to them: is it true, as has often been stated, that you possess very few rights? They did not agree. They possessed sufficient rights for exerting an influence on the course of operations in the rural areas. However, these rights had to be employed in an intelligent manner. Yes, today there are many shortcomings in the work of RAPO's. But it is not simply a matter of these shortcomings being illegal. Many workers simply employ obsolete methods and are unable to utilize even those rights extended to them. The operational style and methods must be changed decisively and particularly at the rayon level.

Unfortunately, during the 2 years of its existence the RAPO has accomplished considerably less than it could have. The partners of the farmers are still uttering quite often such phrases as: "we and they" and "the RAPO and us." and what is a RAPO? It is a kolkhoz, it is a sovkhoz, it is Selkhoztekhnika, it is Selkhozkhimiya and it is a meat combine. All of these taken together constitute a RAPO. The essence of its work consists of interaction and the combining of the efforts of all partners without exception. Success can be achieved only on this basis.

Summary of Results

What was the subject of the IZVESTIYA roundtable discussion?

It concerned the need for presenting the kolkhozes, sovkhozes and RAPO councils with more economic independence and raising their responsibility and also the interest of all APK partners in the final results based upon complete cost accounting.

And certainly it concerned the as yet to be overcome psychological barrier of former administrative forms. Unfortunately, many RAPO's have only changed the sign, while the operational style and methods of the rayselkhozupravleniyes remain. This is being felt, and painfully so, on the farms. Thus the RAPO's must master more rapidly the economic methods and not the distributive, volitional and other methods of administration. And this applies not only to the kolkhozes and sovkhozes but also to each partner of a farmer in the agricultural industry.

Further improvements in the work of the agroindustrial complex assume the implementation of a number of measures which will make it possible to administer, plan and finance it as a single entity at all levels.

Energetic and thorough preparations must be made for this. If the desire is present and if the work is carried out in an industrious manner, much can be accomplished today in the various areas aimed at overcoming the departmental barriers. Here the local soviets of worker's deputies must perform in a more active manner. They and certainly the RAPO's must become active proponents of a key aim of the April (1985) Plenum of the CPSU Central Committee: there must be one master for the land!

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CSO: 1824/560

## CHANGES IN APK MANAGEMENT ADVOCATED

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 6, Jun 85 pp 26-30

[Article by L. Zalevskiy, professor and doctor of economic science; V. Bazhan; N. Kononov, candidate of economic science (Simferopol): "To Perfect Management in Agricultural Enterprises."\*]

[Text] In V. Chernyak's article "Urgent Problems in the Perfection of the Economic Mechanism," which opened the discussion, there is an examination of the directions to a fuller utilization of the possibilities for an increase in the quality of management at all levels. Attention is quite rightly called to quests for new, more progressive forms of production management. While sharing this position, we consider it necessary to direct attention to the following.

The effective utilization of the developing productive forces and of the achievements of science and technology in the subdivisions of the APK [agroindustrial complex] today requires a basic change in the character, style and methods of managerial operations. The times have passed when the work style of a farm manager was set up as an example if he strove to be successful everywhere and to personally control everything. The contemporary state of development of large-scale socialist agricultural production requires a systemic understanding and solution of management problems.

It is impossible to examine all the principal directions for the improvement of the system of the management of agricultural production in this article, but we will settle on one—in our opinion, the basic one, without which one could not even begin to talk about truly scientific management—on the problem of the regularization and scientific organization of the managerial work of managers and specialists in the course of developing the documents regulating that work, and in these documents—the singling—out of a section concerned with the delegation of authority for the prupose of promoting the strengthening of independence and democracy in the management of the economic structure of the enterprises of the APK.

<sup>\*</sup>This is the continuation of a discussion begun in the first issue of the journal for 1985.

The CPSU Central Committee and the USSR Council of Ministers, in the 1983 decree "Concerning Additional Measures in the Expansion of the Rights of Industrial Production Associations (Enterprises) in Planning and Economic Activity and in the Strengthening of Their Responsibility for the Results of Work," directly indicate that, along with consistent and persistent introduction of proven forms and methods of management, it is necessary to implement a system of additional measures for expanding rights in planning and economic activity, and for guaranteeing their genuine economic self-interest in achieving a high efficiency of production.

Questions of an expansion of rights, and independence, and, at the same time, of an increase in responsibility for the results of work and the development of democratic principles in the management of the entire national economy (including agriculture as well) in combination with centralized management, have paramount significance at the present stage. (Footnote 1) ("The economic independence of production units is an obligatory pre-requisite for the development of profit and loss management, for the application of economic incentive, and for the full use of commodity-monetary relations... The hierarchical principle in management and planning conforms with the nature of the economy as a large complex system: the division of problems by levels and their solution at those corresponding levels.," V. Chernyak, "Urgent Problems in the Perfection of the Economic Mechanism", EKONOMIKA SOVETSKOY UKRAINY, No 1, 1985, p 44.) The country is successfully going through a large-scale economic experiment in the industrial and other ministries. However, in agriculture, unfortunately, questions of the expansion of rights and independence, of the delegation of authority and, on this basis, of the strengthening of the related responsibility for the results of work, are still unresolved. A fundamental turning point on these questions has not yet come with the organization of the rayon agro-industrial associations (RAPO), and will hardly take place if a decisive turn is not made towards that main thing from which real "working" rights and responsibility, and consequently also the effectiveness of management, stems namely towards precise and clear-cut regulation of the work of managers and specialists and with it, also, of responsibility for its results.

Historically, a tradition of making at times even simple and trivial decisions for the most part at a higher managerial level has developed in the practice of agricultural management. It is well known and indisputable that a socialist economy is a centralized economy. But, nevertheless, far from all economic decisions must be made at the general economic center. It is exactly this that most frequently discredits the principle of democratic centralism. The fact is that for every level of management there exist its own spheres both of independence and of responsibility. As regards the making of decisions on a high level when there is no necessity for it, it is a consequence rather of an inadequate standard (kul'tura) of management. We conducted an in-depth sociological investigation on the kolkhozes and sovkhozes of the Crimean and Zaporozhye Oblasts, in which chief agronomists and chief economists, in all 142 people, participated. To the question "Are higher managers concerned with your opinion in making decisions on strategic questions?", every other person replied in the negative. That is a serious warning to reflect upon.

In practice a confusion of the two concepts—obligations and responsibility—and also an ignorance by higher managers of their distinct and precise rights and authority on each specific question has developed and firmly taken root. Formally, standard legal documents (normativno-pravovyye akmy) for each agricultural manager and specialist of any rank have been secured, as is known, in official instructions. However, if one looks at those instructions more attentively, then it is immediately evident that they represent rather formal and abstract documents written in quite general and, for the most part, "evasive" language. That is why in earlier times they were practically never used, and are now practically never used, in the practice of management.

We consider that, under conditions of the successful commencement of the activity of the new rayon organs for the management of the agro-industrial complex (RAPO), it is necessary to begin with the development of quite different regulatory documents, which would not simply exist, but would function and would help. Unlike the official instructions, the basis of these documents, in our view, should be the main thing—the functions of management. We stress—the specific functions which each managerial worker of the APK system is obliged to fulfill and which he should specifically answer for personally—functions which would clearly define tasks, the directions of his official activity, and that for which he should bear responsibility. Such a document will, more correctly, not be called instructions, but the official functional position (dolzhnostnoye) funktsional'noye polozheniye) of the manager (specialist), structurally consisting of three sections: 1) General provisions, 2) Functional responsibilities, 3) Delegation of authority.

In the first section the principal task of the worker, his place in the system of joint subordination, and the general qualifications required of him are defined. The forms of responsibility for the timely and high-quality fulfillment by him of officials duties, along with a listing of specific administrative, economic, and other measures which he can and must undertake for those goals, are also prescribed.

In this second section, taking into account the specific peculiarities of production and its management, there is for each worker prescribed a detailed list of specific functional responsibilities (authority), which does not permit a double interpretation. This authority is collected and legally secured in this section with the use of a so-called "Classifier of Managerial Work."

This primary (iskhodnyy) scientific document was developed by the Department of Management of the Crimean Badge of Honor Agricultural Institute imeni M. I. Kalinin, in close collaboration with Crimean farm production workers, after preliminary study and precise division into parts (vychleneniye) of 20 of the most necessary functions in farm management with a complete collection (nabor) of specific managerial operations for each scheduled (nomenklaturnyy) position. It represents a graphic matrix form in which functions and managerial operations are distributed on the vertical line, and positions and specialities on the horizontal.

In the Classifier, at the intersection of the lines of each specific function and managerial operation with the graph where the official positions of all of the executives are designated, there are recorded the conventional symbols (numerical codes) for the component parts of each function and managerial operation—in accordance with the Classifier vocabulary developed for this purpose. This vocabulary, properly speaking, is essential for the simplification of further work in compiling the official functional positions, and represents essentially a list of the symbols (codes) for all the types of managerial activity necessary for the preparation, adoption and implementation (for each function and managerial operation) of specific decisions at various levels of management.

In the Classifier worked out in this manner, the entire complex of diverse functions and operations at all levels of management is represented clearly and understandably for all is; as a result, it becomes a basic and primary document utilized later for the development of section 2 proper. For each of the 20 functions shown in the Classifier, the level of participation of the specialist or the manager in the fulfilling of one or another type of managerial operation—coordination, review, analysis, control, agreement, decision—making, and so forth—is specifically and precisely defined. Actually, this section enumerates all of the "what" that the worker must do (in contrast to managerial procedures which answer the question of "how" to do them). Incidentally, we consider the combining of responsibilities and rights into one concept as completely correct since any responsibility automatically gives birth to the right to execute it, and the right itself makes it obligatory.

Cited in section 3 is a list of the powers (from section 2) on the basis of which the worker must independently make final decisions and bear complete, personal responsibility for their implementation (this authority deriving from his official functional position), and also enumerated (and this is the main thing for truly scientific management) are those functions and operations which, on the one hand, are transferred (delegated) to him from higher levels of management along with the right of complete and final decision on them and the same degree of responsibility for the consequences of their fulfillment (implementation), and on the other hand,—functions and operations which a given worker can transfer from himself to a lower level—again with the right of independent and final decision on them and full responsibility at those levels. In other words, the final decision is always made by the one who bears responsibility for the final results.

The introduction into the official functional positions and the application in industrial practice of the "Delegation of Authority" section allows for the resolution of the problem of the most valid relationship of centralization and decentralization in management. (Footnote 2) ("Both theoretically and practically it becomes evident that first, the center must be focused on that which can not be done by the economic units [it must not do anything that the economic units are able to do], secondly, it must be occupied with that which in the system of direct economic ties has been long and ineffectively decided. Life has dictated the necessity of the transference of the center of gravity in

making a number of decisions to the level of production units [including authority in the spheres of planning of price formation and of the distribution of revenues].", Ibid., p 44.) Presently, there are enough highly skilled cadres for all levels of management in agriculture. Therefore, the question of the delegation of authority, that is, the transfer of the complete right to independently decide a given range of questions and to bear full and, of course, personal responsibility for their solution has an urgent significance in the contemporary stage of the development of the national economy. The manager must not only be able to, but also must and is obliged to, judiciously divide up the work between himself and his assistants. In the Zarya sovkhoz of the Simferopol'skiy Rayon, for instance, has been delegated the decision of such cardinal questions as day-to-day and long-range technological planning, housing and cultural and welfare problems, work planning, etc., from the general-farm level of management to the section managers. This does not mean dodging the control and regulation of processes; what has been transferred in full is only the right to independently decide, and then also to answer for, the questions transferred to them.

The aforesaid does not rule out the exchange of experience, a kind of managerial tutorship. But this tutorship is essential not for tutelage or playing-safe, but for the continual business-like exchange of information and the implementation of feedback between the manager and the subordinate, and for the assurance on the part of the manager in the correctness of the delegation. Moreover, subordinates must constantly be well-informed about the status, goals, and tasks of the entire system -- whether it be the branch (otrasl'), the sector or the farm as a whole. The director of the sovkhoz has long since broken with the need for daily supplementary orders and instructions to economic subdivisions. An adjustment of all of the general tasks, for all the managers and specialists without exception, is conducted only once a month. Similar schedule-meetings (vstrechi-nasyady) with department managers, branch specialists, shop chiefs and service chiefs, are conducted once a week, and with chief specialists--every day. The many years' experience of the Zarya sovkhoz confirms that such a management arrangement broadens the scale of mutual understanding and cooperation and permits easier surmounting of conflicting views and quicker eliminating of disputes.

Losses caused by an excessive centralization of management, and by the delay in decisions due to this, at times inflict greater harm than not completely optimal, but on-the-spot and quick, decisions made independently by a subordinate. The delegation of authority represents an effective method of making and carrying through managerial decisions.

Presently in the national economy, self-financing, internal self-financing, the collective contract, and the like, are becoming more and more common. The indisputible advantage of carrying out production in self-financing conditions, from the point of view of management, lies in shortening lines of communication and flows of information, in a more complete adherence to the principles of one-man management and collegiality, in bringing the decision-making centers closer to the executives, and finally, in relieving the highest echelon of management of petty and routine matters. "The true strengthening of centralism consists in freeing the central managerial organs from having to resolve petty matters." (Footnote 3) (Ibid., p 44.)

Contemporary views on management require that maximum authority be granted to each worker in the fulfillment of specific functions, restricted only by the necessity of overall control on the part of the central administration. In official functional positions, delegation of authority is exactly that division which, by means of its careful, scientifically-based development and persistent introduction into management practice, removes the problem of so-called "daily routine business." At present, very many managers and specialists (including also those in the new RAPO's) daily and hourly do both their own work and the work of "others." It is exactly this that gives rise to confusion in management.

The practical experience of the development, introduction, and utilization on Crimean farms of official functional positions with the singling-out of the section "Delegation of Authority," demonstrates that at first (in the course of the first year) innovations caused difficulties. This is understandable: inertia impedes thinking. Besides this, complications connected with interpersonal relations, also arose. The problem of the so-called extent of delegation now arises: the selection of the kinds of powers (the quantitative aspect), and the depth of delegation (the qualitative aspect). The ideal thing would be the assignment of specific directions to each manager and specialist -- which functions, in what volume and to whom, and in what manner to delegate. However, exactly in this lies the entire importance, the true significance and complexity of delegation -- that it would be impossible, in a centralized fashion, "from above," by standardized recommendations for all farms (as it was under the official instruction), to provide for all of the factors playing a role in each specific case. The tasks in this business are always and everywhere specific, and managers have been forced (and it could not have been otherwise) to do this taking specific conditions into account.

Also often impeding this is the fact that the manager sometimes doubts the capabilities of his subordinates, and is sure that no one else can fulfill one or the other of his functions (or even some simply one-time commission of his) as well as he himself could do it; that is, he considers that the delegation of authority can harm production and threaten the final results. In such a case, the manager's full personal confidence in the subordinates serves as a pre-requisite for the legally assigned delegation of authority. And the most reliable road to the creation of an atmosphere of confidence is the correct selection of cadres.

Thus, scientific delegation of authority through carefully developed official functional positions, beyond any doubt, eases to a significant degree the work of management personnel, and makes it not only more productive and effective but also more attractive and creative. We are firmly convinced, and are fully in agreement with V. Chernyak in this, that "the art of management also consists of the ability to employ all reserves." One such powerful reserve is the decisive shift from outdated official instructions to the development and introduction of fundamentally new documents regulating management, with the obligatory singling-out in these documents of a section on the delegation of managerial authority.

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12911/12795 CSO: 1824/2

# AGRO-ECONOMICS AND ORGANIZATION

## ACADEMICIAN RECOMMENDS LATVIAN APK REORGANIZATION

Riga KOMMUNIST SOVETSKOY LATVII in Russian No 9, Sep 85 pp 54-61

/Article by A. Kalnynsh, Corresponding Member of the Academy of Sciences of the Latvian SSR: "Economic Mechanism of the Agroindustrial Complex"/

Text/ For further raising the effectiveness of agricultural production and for the successful development of the entire agroindustrial complex, considerable importance is attached to improving the economic mechanism. Whatever question we examine and regardless of the economic approach employed, in the final analysis everything rests upon the need for bringing about serious improvements in administration and in the economic mechanism on the whole" stated M.S. Gorbachev in a report delivered before the April (1985) Plenum of the CPSU Central Committee. Further improvements are also required in the administration of the agroindustrial complex.

The reorganization of the economic mechanism of the APK, including its organizational structures, carried out in conformity with the decisions handed down during the May (1982) Plenum of the CPSU Central Committee and subsequent decrees of the party and government, has played an important role. Within the framework of the rayon agroindustrial associations created at the time in all areas, as economic formations of the territorial-branch type, the problems concerned with production specialization, concentration and industrialization are being solved more effectively and with extensive use being made of the advantages of inter-enterprise cooperation.

The creation of rayon agroindustrial associations is also a new stage in the development, drawing together and, in the final analysis, merging of the two forms of socialist ownership -- state and kolkhoz-cooperative. Under RAPO /rayon agroindustrial association/ conditions, more efficient use is being made of an important principle of democratic centralism -- combining centralized management at the rayon level with the economic independence and initiative of individual enterprises and organizations. Farms which are members of an association are being given greater rights and opportunities for collectively solving the problems concerned with the social development of the rural areas.

At the same time, it is completely clear that it will be necessary to improve still further the economic mechanism for developing the agroindustrial complex at the rayon and at higher levels. This is particularly true in view of the fact that the economic status of a RAPO has still not been raised to that for the

model initially planned and in some respects a definite deviation from the model of the first associations even took place in connection with the adoption of the Standard Statute Governing RAPO's and this was felt in particular in the system of planning, financing and logistical support -- both in the sphere of agriculture proper and in the work of organizations engaged in providing production-technical services for agricultural enterprises. A reduction has still not taken place in the number of planning indicators made available to the RAPO's and agricultural enterprises. The output volumes are not being coordinated with the logistical resources on a normative basis. As a result, a great amount of difficulty is being encountered in the process of further raising the economic independence of the kolkhozes, sovkhozes and other APK /agroindustrial complex/ enterprises and also for the rayon agroindustrial associations.

In this regard and during the given stage, the task has been assigned of introducing substantial changes into the organizational structures for administering the agroindustrial complex and bringing to a logical conclusion improvements in administering this important sphere of the national economy. It was precisely for this purpose, as is known, that the Politburo of the CPSU Central Committee supported the recommendation by the RSFSR Council of Ministers and local party and Soviet organs concerned with carrying out economic experiments aimed at improving administration and the economic mechanism in individual agroindustrial associations of the Russian Federation. The plans call for a check to be carried out on the operational effectiveness of kolkhozes, sovkhozes and other agricultural enterprises in certain krays and oblasts, under the new conditions for production planning and for the procurements and delivery of products, and for evaluating the feasibility of making the enterprises and organizations of a number of ministries subordinate to agroindustrial associations. Measures have been defined for increasing the economic stimuli for carrying out more tense plans and for raising the material interest of labor collectives and farm leaders and specialists belonging to associations in the final production results.

The solving of these problems is considered to be of vital importance to our republic. What measures should be undertaken in this regard and how?

At the rayon level, all agricultural enterprises having multiple-branch production structures, including the Ministry of the Fruit and Vegetable Industry, should first of all be subordinated directly to a RAPO council. An exception to this could be single-product enterprises -- poultry factories, hothouse combines, wild animal breeding sowhozes, which are included directly in republic, kray or oblast branch economic formations. Such a conclusion has already been reached in a number of regions throughout our country. A requirement now exists for ensuring that this principle is carried out in a consistent manner and realized fully in actual practice.

In addition, rayon agricultural service formations (rayon associations of Goskomselkhoztekhnika and Selkhozkhimiya, inter-kolkhoz construction organizations and mobile mechanized columns for aquicultural construction) should be subordinated directly to a RAPO council as inter-farm RAPO enterprises. This would make it possible, with kolkhoz and sovkhoz assistance, to define more completely and more accurately the tactics and strategy for their operations. The advantages of such a system are well known and they have

been proven in actual practice. However, as is known, many rayon agricultural service organizations in a majority of the republics, krays and oblasts, including in the Latvian SSR, have dual subordination and this does not promote improvements in their interaction with the farms.

A requirement also exists for providing a rayon agroindustrial association with plan-limits for capital investments, equipment and other resources, in the form of a single indicator with the RAPO council being authorized to distribute them among the kolkhozes, sovkhozes and all organizations. At the present time and even for a rayon Selkhozkhimiya association, a capital investment limit is made available by an individual construction project and not together with kolkhozes and sovkhozes.

The trends and concepts for developing the agricultural services should also be defined more precisely, bearing in mind the need for improving and lowering the cost of these services for the principal production enterprises of a RAPO --kolkhozes and sovkhozes. Thus the transferring of the functions of production-technical services from the appropriate subunits of agricultural enterprises to specialized agricultural service formations can be carried out only if the rendering of services in terms of total expenditures turns out to be cheaper than if the kolkhoz or sovkhoz used its own resources under exemplary conditions and with equal logistical supply services. This condition must serve as the basis for adopting decisions having to do with the creation of new agricultural service organizations and also when evaluating the activities and defining more precisely the profile and structure of existing organizations.

Obviously, integrated economic formations should also be created ideally by stages for the purpose of ensuring a single cycle for the production of individual types of agricultural products -- cultivation, storage and processing and in some instances the trading of such products. This applies first of all to the marketable output of field crop husbandry (if, certainly, the processing enterprise operates mainly on the basis of raw materials obtained in its own region). Under these conditions, an opportunity is created for orienting the economic mechanism more consistently towards obtaining a maximum amount of high quality final product. In such a case, the plan for a RAPO can be established not for the intermediate product (for example, for potatoes for technical processing), but rather for the final product (for example, starch).

The conversion to closer integration in the production of agricultural raw materials and their initial processing must become a common regularity. Certainly, the specific forms for this integration may differ depending upon the types of products, zonal peculiarities and the importance of the changes planned. The best and most effective solution is one in which both phases of the technological process -- cultivation and initial processing -- are united by a common organizational principle.

At the same time, it should be emphasized that the complete integration of administration in a region cannot be achieved under present conditions. When a large number of departments are retained at the republic and union levels, departments which independently control individual spheres of the APK, the rayon agroindustrial associations are capable of utilizing only partially the rights extended to them. It thus follows that appropriate changes must be

carried out at the republic and union levels. At the present time, the management of the agroindustrial complex at these levels is characterized by an incomplete organizational structure. The committees of presidiums of councils of ministers for problems of the agroindustrial complex have not become competent organs for the management of this most important sphere of the national economy. The mentioned formations cannot ensure organizational and economic unity in planning, in the economic mechanism or in the administrative structure for the APK.

For solving the tasks associated with achieving such unity in the Latvian SSR, it is believed that an all-round experiment should ideally be carried out aimed at improving the economic mechanism of the APK, one which encompasses the questions concerned with changes in the system of planning, economic stimuli (levers) and organizational structures. It must be considerably more extensive and thorough compared to the experiments presently being carried out in Estonia (a republic agroindustrial association has been created there) and Georgia (State Committee for Agricultural Production). Actually, the last two formations lack not only a team for the processing of agricultural products but also a number of important units of the principal element of the agroindustrial complex (agricultural enterprises of the Ministry of the Fruit and Vegetable Industry) and individual spheres of agricultural services (organizations of the system of agricultural construction).

The agroindustrial Kuban Combine, which was created by way of an experiment in Timashevskiy Rayon in Krasnodar Kray, is favorably distinguished by a thorough and all-round approach for solving those problems concerned with improving the economic mechanism. It is developing as a production-economic complex for the production, procurement, processing and wholesale (and even retail for some types of products) sale of agricultural products and food goods. All enterprises and organizations engaged in producing the final product are directly subordinate to the combine and they have been transferred over from the appropriate branch ministries and departments to the "Kuban" balance. The mentioned experiment is being carried out only within the framework of an administrative region and yet the principle concerned with the creation and functioning of the combine can be used at the republic level.

When carrying out the proposed experiment in our republic, the organizationaleconomic form for the republic agroindustrial complex should be changed into the Latvian ReAPO /respublikanskoye agropromyshlennoye obyedineniye; republic agroindustrial association/ or Latvian SSR Agroprom. This would create the conditions required for balanced and proportional development and unified planning, financing and administration for all of the production-technological elements engaged in the production of food products and agricultural raw materials. Logically, elements of Agroprom for the Latvian SSR should be created at enterprises and organizations of the republic ministries of agriculture, fruit and vegetable industry, land reclamation and water resources, procurements, meat and dairy industry, alcohol-starch, starch and sugar plants of the Ministry of the Food Industry, flax plants of the Ministry of Light Industry, State Committee for Production-Technical Support for Agriculture in the Latvian SSR, Administration for Fishing of the Council of Ministers of the Latvian SSR, Administration for the Peat Industry of the Council of Ministers of the Latvian SSR and Latvkolkhozstroy.

The formation of Agroprom for the Latvian SSR, based upon the above-mentioned reorganization, can be carried out simultaneously (by one legislative act) or by stages, depending upon the specific objective and subjective conditions and factors (for example, upon the readiness of local economic personnel to work under the new conditions or upon whether or not the union branch ministries and departments displayed a strictly all-round approach for achieving the conditions required for carrying out the experiment for the republic's Agroprom). If a decision were handed down calling for an experiment to be carried out by phases, then during the first phase Agroprom should ideally be created based upon a reorganization of the spheres of agriculture (ministries of agriculture and fruit and vegetable industry) and agricultural services (Goskomselkhoztekhnika, Ministry of Land Reclamation and Water Resources, republic Mezhkolkhozstroy and Selkhozkhimiya associations and the Administration of the Peat Industry). These changes should ideally be carried out by the republic's Ministry of Agriculture. A greater number of economic leaders and researchers are displaying a preference for just such a model.

But the combining of the mentioned departments can be carried out only if the cost accounting independence of agricultural and other enterprises and also the RAPO's themselves is further strengthened and there is a redistribution of powers and responsibility in favor of the principal cost accounting element. The functions of current operational management and production planning are turned over to the lower elements of the administrative structure. And the republic elements retain the functions of strategic production administration and production-technical services. As a result, it should be possible at the upper levels of management for the agroindustrial complex to reduce substantially the list of functions carried out and, at the same time, the cumbersome nature of the administrative apparatus. It should be emphasized in particular that the implementation of the changes called for in the first stage should raise substantially the role and effectiveness of the rayon agroindustrial associations.

Within the Agroprom framework (at the rayon and republic levels), an intensification should also take place in the work concerned with creating integrated economic formations, in the interest of eliminating departmentalization and achieving a concentration of the production and scientific-technical potential. This developed, for example, in the sphere of rural construction, where a single system ideally should have been formed based upon a merging of the appropriate formations and services of the Ministry of Agriculture, Latvkolkhozstroy, Goskomselkhoztekhnika and others.

The agricultural service enterprises and organizations of rayon subordination should have been turned over directly to the agroindustrial associations. This undoubtedly would raise the effectiveness of their work and bring their interests more in line with the interests of the service customers -- kolkhozes and sovkhozes. A RAPO, upon receiving resources from the republic's Agroprom, could distribute them more effectively and more deftly among the agricultural enterprises and specialized agricultural service organizations. During this same stage, the production-technical servicing of enterprises of the processing industry should also ideally be turned over to the agricultural service formations.

During the second stage, in conformity with the proposed model, an even more integrated republic agroindustrial association is created, one which includes the production, procurement, processing and wholesale selling of field crop husbandry and livestock husbandry products. Services (or economic formations) are formed here which ensure a unified production-technological cycle for the cultivation, procurement, storage and processing of individual types of products. The appropriate enterprises (for example, meat combines and sugar plants) and organizations (scientific-research, design subunits and others) of a republic or inter-rayon nature are made directly subordinate to them, while the functional management of the branch (for example, sheep breeding or poultry raising) in multiple-branch agricultural enterprises is carried out by these formations through the councils of the respective RAPO's.

Certainly, the implementation of the second stage requires additional economic experiments at the rayon and republic levels. With regard to the union APK level, the solution for the problem concerned with closer integration of the spheres of production and processing requires an elastic approach in view of the tremendous scales of our country. But it would obviously be incorrect to state that no changes are required at this level. In the future, a greater number of the solutions found for problems associated with the development of the agroindustrial complex should be made available to the republic organizations. With such a reorganization, the union level of APK administration will be simplified. For example, at the present time a number of functions concerned with the processing of agricultural products have been centralized without justification; a portion of them could be turned over to the republic organs of administration. And the union organs should concern themselves mainly with carrying out those functions associated with solving the larger strategic and inter-branch problems of APK development and they should serve in the role of strict consumers of the products and services of the ministries of agricultural machine building, the chemical and microbiological industry, the construction materials industry and others. Here it should be borne in mind that the structure and functions of the transformed organs of APK administration in the center, union republics, krays, oblasts and rayons will not necessarily be identical. At the present time, the mechanical copying in the republics of the various union organs is conditioned by a desire not to disrupt the logistical supply relationships or the allocation of limits for capital investments and other resources, since quite often the resources required are distributed among individual branches and departments and in the various areas (rayons, oblasts, republics) disproportions often arise among the individual technological elements. In connection with the above, I would like to refer to an instruction issued by M.S. Gorbachev in a speech he delivered during a CPSU Central Committee meeting concerned with the problems of accelerated scientific-technical progress: "A great amount of work remains to be carried out in connection with improving the structure of the organs of republic administration, where the number of ministries and departments is excessive and continues to increase. Here the problem concerned with the integration and concentration of administration is greater than at the union level."

The essence of this problem consists mainly of achieving a rational combination of the territorial and branch principles in the organization of economic activities and, on the one hand, orienting all spheres of the territorial

agroindustrial complex towards the production of the final product with minimal expenditures and, secondly, taking advantage of the advantages offered by more intense branch specialization in production and services.

When carrying out the experiments of the 1st and 2d stages, it is our opinion that too much emphasis should not be placed upon a broad interpretation of the limits of the APK. During this modern stage, it would be wrong to include in it the spheres for the production of the means of production and the food trade.

The question concerning the naming of such a large-scale economic formation requires special examination. Instead of ReAPO (Agroprom), it could be called a union-republic ministry of the agroindustrial complex or a state committee of the APK for a republic or the union. However, beyond any doubt the selection of a particular name must not change the essence, goals, tasks or rights of the new economic formation.

It is important for a republic agroindustrial association to be a state and economic organ of administration, possessing all of the rights for managing the development of the agroindustrial complex and fully responsible for the final results of its work. The activities of Agroprom must be planned and financed as a single entity and in a separate column. Moreover, in the five-year and annual plans for economic and social development, for example of the republic's Agroprom, provision should ideally be made only for the delivery volumes for products into the all-union fund, payments into the budget and appropriations from the budget, the overall (normative) wage fund and the volumes of logistical resources allocated.

The planning-economic and financial service of Agroprom must ensure summary planning and financing for all resources and for the final product for individual spheres of Agroprom and on the whole, the preparation of concepts for the development and systems for administering individual units of Agroprom, improvements in the economic mechanism and the development of information systems. They must also establish intra-departmental accounting prices for products sold within an association, the wages and rates for services and work rendered and they must create centralized funds and determine the order for their use.

Computations have shown that the proposed reorganization of the system for administering the agroindustrial complex may furnish a number of notable advantages.

As a result of an intensification in the processes of agroindustrial integration, an improvement will take place in the distribution for the production of agricultural raw materials and in the capabilities of the processing enterprises and there will be a decline in those product losses occurring during post-harvest processing, transporting, storage and processing. Owing to this factor, the food resources and agricultural raw materials for industry, in terms of individual types of products (vegetables, potatoes, fruit and others), may increase by 5-20 percent.

More favorable conditions are being created for the accelerated and complete introduction of scientific-technical achievements into all stages in the

production of agricultural products and delivering them to the consumer and for the introduction of waste-free production operations.

A further improvement will be realized in the role played by economic levers and contractual obligations in the relationships between partners through the extensive introduction of intra-departmental accounting prices which will be mutually advantageous and economically sound, an opportunity will be created for the formation of an elastic system for the formation and use of centralized funds and other resources and an increase will take place in the material interest of partners in the Agroprom system, at all levels of production and administration, in achieving high final results with minimal specific capital-output ratio and wage-intensiveness.

Thanks to the creation of integrated agricultural service organizations, the duplication of individual elements of the logistical base at the rayon level (mechanical workshops, garages, petroleum bases, warehouses, specialized construction and other types of equipment) will be eliminated. The savings in capital investments may reach 15-25 percent. A reduction in the number of administrative personnel and engineering and technical workers will take place at the rayon level (10-20 percent) and especially at the republic level (15-30 percent).

Studies that have been carried out and an analysis of accumulated experience reveal that conditions are right at the present time for carrying out such an experiment at the republic level. Ideally, it should be comprehensive in nature and encompass all of the principal aspects of the economic mechanism: planning, economic mechanism, administrative organizational structures. Once the experiment has been carried out, certain corrections and refinements can be introduced and the experience obtained will promote the development of an overall concept for development of the economic mechanism.

In the interest of improving the results of the proposed experiment, solutions will have to be found for certain organizational-methodological questions. At the present time, various models are being developed in agriculture and in other spheres of the APK for carrying out economic experiments. Some of these models are already being introduced into operations. However, as yet an efficient system has still not been created for the development, examination, approval and implementation of the experiment or for analyzing and evaluating it. Thus, at times an examination of the plans for experiments is being dragged out and at other times they are being accepted in haste with consequent discrepancies and defects. In addition, in some branches, for example in the meat and dairy and food industry, the economic experiments are being carried out for a group of "industrial" branches and they are not being coordinated adequately with other spheres of the agroindustrial complex and particularly with agriculture. Thus the question regarding unified direction for improving the economic mechanism of the agroindustrial complex warrants examination. Towards this end, it is considered advisable to form a permanently active committee for providing overall direction for the economic experiment in

The proposed measures will promote more harmonious and efficient work by all elements of the agroindustrial complex.

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CSO: 1824/87

# AGRO-ECONOMICS AND ORGANIZATION

# INTERBRANCH ORGANIZATION PROBLEMS IN UZBEK APK

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 10, Oct 85 pp 91-95

[Article by Yu. Krasnopoyas, doctor of economic sciences and professor, and by I. Mardanov, candidate of economic sciences, under the rubric "The Country's Agroindustrial Complex," Moscow, Tashkent: "The Organizational Mechanism in Managing the Agroindustrial Complex (Using the Uzbek SSR as an Example)"]

[Text] A distinguishing feature of the mechanism of APK [Agroindustrial complex] management is the organization of interrelations of the most closely-related branches, departments and regional agroindustrial enterprises, the operations of which are directed at achieving their common end goal—to fulfill more and more fully the needs of the population as regards food products and other consumer articles made from agricultural raw materials.

The regional (union republic) APK is not a closed system producing the finished product. The regional complex must satisfy the general population's needs while participating in a division of labor on a national scale and it must also satisfy the needs of the republic's population for food products and articles produced by light industry; it must also further the social development of the village. To a large extent this also applies to the agroindustrial complex of the Uzbek SSR.

Today the implementation of the Food Program within the republic is being directed at achieving efficient norms for the consumption of food products by the population. For this reason, in addition to the continued growth of cotton production and to improvements in the quality of cotton special attention must be focused on the development of the republic's food complex.

National economic and regional agroindustrial complexes are interrelated in terms of the process of implementing goals. The production-functional structure of the APK conveys the functional and technological interrelations between groups of branches and enterprises. Branches participating in the creation of the end product in the Uzbek SSR can be grouped into five large blocks (spheres)--those producing material-technical resources for the APK; those producing agricultural products; those processing agricultural products; those providing services for agroindustrial production; and those within the social infrastructure of the APK.

At the present time within the structure of the Uzbek SSR APK there are four basic products subcomplexes--cotton, fruit and vegetables, livestock raising and grains. Of these, the cotton subcomplex is the leader. Within the republic's APK 42 percent of the complex's total production comes from cotton farming and from the cotton-cleaning and light industries which utilize this raw-materials base.

Each subcomplex has its own goals, tasks, composition and structure.

The organizational-management structure of the APK expresses the interrelations between the branches and departments that are a part of it as concerns the organization of production, labor and management. Let us examine the questions related to improving production structure from the point of view of its effect on the organization of APK management.

In addition to a single end goal and functional interrelations between the branch and enterprises, the criteria of controllability is important when developing the branch composition of the complex. At the first stage of development of the republic APK it is expedient to single out the most interrelated branches of the national economy as the object of effective management: agriculture--primary and, in part, complete processing of agricultural raw materials--production and technical services to these branches--village building. At succeeding stages the circle of branches that become the unified object of management will be expanded until the production of the final product from agricultural raw materials and the sale of these products are also encompassed.

In recent years a number of problems have arisen related to the continued development of all products subcomplexes of the APK, and above all of the leading subcomplex within the Uzbek SSR's APK--cotton. In 1984 for the first time in a number of years the plan for cotton procurement was not fulfilled. The quality of procured cotton is improving slowly. Annual losses of cotton during storage sometimes exceed 350,000 tons. This is the result of the following circumstances:

- --Not all enterprises adhere strictly to the agrotechnical requirements for raising cotton, which leads to the untimely maturation of cotton (excessive prolongation of the harvest campaign, late implementation of late-fall plowing of fields or plowing during the spring with a subsequent delay in the sowing campaign and violations in technology for care for and harvesting of raw cotton, and so forth);
- --The cotton varieties that have been developed recently do not fully meet the requirements of overall mechanization for cultivation and especially for harvesting. Weather-climatic conditions require the development of more rapidly-maturing varieties;
- --The technical-operational specifications of cotton-harvesting machines also do not meet contemporary requirements. Machine-harvested cotton deteriorates rapidly in quality. For this reason, procurers and processers are hardly interested in receiving cotton that has been machine-harvested;

--The cotton-cleaning industry has not been supplied with adequate production capacities to make a transition to seasonal processing of raw cotton (3-4 months), which would curtail losses of the valuable raw material considerably.

In Uzbekistan the high rate of population growth and consequently of the influx of manpower and the low mobility of the local population have resulted in the formation of free labor resources (especially in village regions), which has brought about several negative phenomena. In order to utilize manpower resources more fully and to even out the seasonal nature of production it would be expedient to build textile, sewing and other enterprises and shops in oblast and rayon centers and affiliates to these in enterprises. All of this must be kept in mind when the management of the republic's APK is improved.

In an effort to carry out the decisions of the May 1982 Plenum of the CPSU Central Committee, by early 1983 the agroindustrial complex was singled out as an independent planning and management object at the national economic and regional levels under the leadership of the corresponding organs. In the republic the Commission on APK Questions of the Presidium of the Council of Ministers is such an organ. The aforementioned organs were called upon to eliminate departmental separateness in the management of agriculture itself as well as of all other APK branches.

Departmental separateness in APK management was manifested in the subordination of agricultural enterprises to numerous ministries and departments as well as to various associations of the agricultural ministry itself and in the scattering of related production functions (for example, village production, water management, reclamation and road building) and similar management functions among various organs. The departmental division of agricultural and non-agricultural enterprises complicated the implementation of a single scientific-technical policy within the branches of the APK and of a single technological management of both agriculture and other APK branches and gave rise to separateness in solving other social-economic problems.

Within the APK system, in addition to the functions of managing its branches, specialized industries and other types of operations, the function of interbranch cooperation and integration of operations of closely-related branches and industries has expanded significantly. But the necessary conditions still do not exist for the complete development of such ties.

The work experience of the Commission on APK Questions has shown that the commission has not had the opportunity to eliminate the departmental separateness of APK partners. The commission is occupied primarily by questions related to the future development of the food complex and of the entire APK and implements some coordinating and control functions within the APK and outside its limits. Many commission decisions are not obligatory for the organization of branches and departments that are organizationally independent of it. As for the efficient management of interbranch production objects and ties within the APK system, the commission has neither the corresponding authority nor the organizational opportunity, i. e. the necessary apparatus, the required specialists, and so forth, to do this.

In the oblast and rayon agroindustrial associations that have been created the working apparatus consists of the corresponding administrations of the republic's agricultural ministry. In composition and purpose these are departmental organs, and other APK partners are not directly subordinate to them. For this reason, most of the problems related to interbranch management and to the coordination of operations of enterprises and organizations of various departments within oblast and rayon APK's are dealt with, as before, by local party and soviet organs.

It would be expedient to implement cooperation between management organs within the system of the republic's APK on the basis of an analysis of the organizational mechanism of complex start-to-finish management of all the processes involving the production of the end product: the production of the means of production for agriculture—their distribution—their operation within the process of agricultural production—the processing of agricultural products—the subsequent sale of these products. This chain can be organizationally subdivided into several links:

--production--distribution--operation--repair of equipment--post-repair operation--writing off of agricultural machinery;

--development of plans and orders for the building of economic and other objects--building--operation of objects;

--production--procurement--storage and processing--sale of the finished product.

The main shortcoming in the interaction of agriculture and machine building, the chemical industry as regards the production of mineral fertilizers, and the building and processing industries is the weak link between these branches and agriculture and with the end results of agroindustrial production.

In 1984 the Kazakh SSR Ministry of the Cotton Cleaning Industry was combined with the Kazakh SSR Ministry of Agriculture in an effort to improve the mechanism of cooperation between cotton-raising enterprises and cotton-cleaning plants. This integration in the management of cotton production and processing is still being implemented only on the republic level and is extending slowly to the level of rayons and lower economic links.

The main problem in the lack of order in cooperation between enterprises and cotton-cleaning plants involves the determination of the quality of cotton that is submitted and accepted. Usually procurers are interested in decreasing the quality rating of cotton being received whereas cotton farmers are interested in increasing it during delivery. The quality of raw cotton is usually determined by approximation, visually, since procurers do not have the necessary equipment and other means for diagnosing cotton quality.

The interests of partners of agriculture are still directed at achieving branch effectiveness. Here there is a greater orientation toward the fulfillment of the plan's indicators of volume. The fulfillment of contracts related to the delivery of products to agriculture, corresponding to the best

international and national achievements, has not become the main evaluation indicator. Often incentives are provided for insignificant modifications and changes in the technical characteristics of machines and equipment.

Differing principles for determining (planning) demand in agricultural production and in material-technical resources give rise to disproportions in material-technical supply.

Improvements in the structure of APK operations management should be implemented on the basis of a programmed-goal oriented approach. Within the practice of programmed management for structural development three types of schemes are utilized--coordinational (a head organization, which has at its disposal all resources for implementing the program, is singled out), program and matrix.

In the process of developing the republic's APK it would be expedient in the future to implement the redistribution of a number of production and management functions among existing organs and to allocate several new interbranch functions:

- --to transfer the guaranteed servicing of agricultural machinery and equipment and the management of these types of operations to the machine building industry with the goal of bringing it closer to the process of agroindustrial production;
- --to separate extensive interbranch reclamation and water management building from reclamation and water management services;
- -- to integrate the functions of village production, road, reclamation and water management building;
- --to single out integrated branches rendering production and technical services not only for agricultural but for all agroindustrial production; these technical branches would provide technical, agrochemical, reclamation, water management, transport and energy services as well as material-technical supplies;
- --at the initial stages of the APK's organizational development to combine the functions of production and initial processing, and then to add complete processing of agricultural raw materials;
- -- to specialize, where possible, in trade with APK products;
- --to allocate the functions of interbranch planning within the APK system, to develop basic methodological prerequisites for the creation of plans for APK levelopment;
- -- to organize the corresponding account-keeping and determine the functions of non-departmental control at all levels of management.

The redistribution of old and the organizational formulation of new functions of APK management within the republic can be implemented in stepwise fashion.

We are speaking about various forms of organizationally securing the functions of operations management of the interbranch complex on the basis of coordinating the program and matrix schemes, with a consideration of the existing management structure. At the first stage the integration of management and the organizational unification of three republic departments—the Ministry of Agriculture, the Ministry of Land Reclamation and Water Management and Goskomselkhoztekhnika | State Committee of the Agricultural Equipment Association]—should be implemented. They comprise the nucleus of the republic agroindustrial association, following the model of the Estonian ReAPO | Republic Agroindustrial Association] or of the Georgian State Committee of Agriculture with a consideration of the special characteristics of the Uzbek SSR APK. In such a situation many current interbranch problems, as the experience of Georgia has shown, will become intradepartmental.

On the oblast level agroindustrial associations will be created on the basis of existing organizations of the three aforementioned departments. Their functions would include the programmed (linear function) management of agriculture and its production-technical servicing. On the rayon level a similar structure is repeated. Association councils are being created. The specific functions of councils are determined by the goals of associations as regards the organization of interbranch management.

On the basis of the development of integration of agricultural production and of the industry that processes raw materials, of production-technical services for agroindustrial production and of agricultural production, reclamation, water management and village road building, conditions arise for the organization of a republic State Agroindustrial Committee (GAPK).

The GAPK must have its own working apparatus, including specialists from all three coordinating departments. The Commission on APK Questions may be retained. Its functions would include the coordination of relations between GAPK and other branches and departments related to the APK. If the commission is eliminated this function is assigned to GAPK.

Of great importance already today for the continued development of the republic APK is the organizational coming together of its first sphere—the production of material—technical resources—vith other spheres. We are speaking about the fact that machine building must take upon itself not only production but also the guaranteed servicing of equipment, capital repairs and other types of technical services. The base that is required for this purpose can be created by means of integration with the repair plants of Goskomselkhoztekhnika.

This type of integration, together with the development of specialization and the growth of concentration of agricultural production, creates real conditions for singling out cotton and other product subcomplexes in the republic APK. In the future it will be possible to organizationally unify GAPK with the Ministry of Light Industry, the Ministry of the Food Industry and associations that build village roads and industrial enterprises for the light and food industries. With this type of production integration and management the republic APK will be transformed into a single complex for the

production and sale of ready end products made from agricultural raw materials.

The fulfillment of contractual obligations and of the APK plan concerning output of the end product must become the basic evaluation indicator of the plan at all levels of production. The principle of production planning related to gross production output and the evaluation of branch effectiveness have an accounting nature. The most important aspect of evaluating operations of APK branches is the total effectiveness of agroindustrial production.

The fulfillment of delivery plans should be made the foundation of a system to stimulate workers in all branches of the APK. This will be the basis for determining the size of the main portion of wages. The system of supplementary wages, including the system of bonuses, will depend on the achievement of end results within the entire APK.

Existing experience confirms the expediency of a transition to a single system of piecework-bonus incentives with periodical advances in all links of the rayon agroindustrial association, where the final accounting with workers is implemented at the end of the year according to the results of economic activity. This type of system of incentives would strengthen the control function of each subsequent link over the operations of the preceding link and of the entire technological production chain.

The rayon link of the republic APK is not an administrative but a production-economic organization. The model for its production-technological and organizational-administrative structure will depend on the directions for specialization and on the level of production integration.

In the Uzbek SSR four types of village regions can be singled out according to their direction of production specialization: cotton-farming, grain, livestock raising and fruit and vegetable farming. Correspondingly, four types of RAPO's are created.

The structure of the cotton-sowing region includes production branches that are technologically related to cotton farming-feed production on croprotation plots, dairy farming and others. The end product of the rayon cotton production association is cotton fiber (in a number of cases-textiles and sewing articles), as well as marketable dairy products and meat. In accordance with this type of model and with the proposed improvement in the management structure of the republic APK a structure for managing the RAPO and its apparatus must be developed.

The creation in rayons of numerous interfarm enterprises having different specializations is inexpedient since it has resulted in complications in coordinating the activities of shareholders in these enterprises (kolkhozes, sovkhozes and others) with those of their higher organizations. All functions related to the administration of interfarm enterprises within a rayon belong to the RAPO.

The improvement of management of the republic's cotton complex will be important in raising the quality of management of the entire republic APK.

Whereas until now all of the necessary conditions have not existed for the organizational-production integration of cotton farming and the cotton-processing industry, today such prerequisites have become available. In Uzbekistan, as has been noted above, the organizational integration of cotton farming with the processing industry has taken place on a republic level. It is necessary that this type of integration be implemented more rapidly at the remaining levels of the APK--the oblast, rayon and intrarayon levels.

The work experience of Narpay Sovkhoz-Plant of Navoy Oblast and of a number of other similar enterprises showed that with the organizational integration of production and cotton processing there is an improvement in all production and management indicators—adherance to production technology, decreased production losses, improved production quality, decreased labor intensiveness, materials consumption, production costs and transportation costs, decreased discrepancies during the delivery and reception of raw cotton and a decrease in the size of the management apparatus.

However, the subordination of cotton-cleaning plants to the agricultural ministry has created new difficulties, and first and foremost with regard to the material-technical supply of these plants. This once again confirms the necessity of both technological as well as organizational-management integration of all spheres of the republic APK.

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CSO: 1824/80

UDC 633.1:631.5

IMPORTANCE OF INTENSIVE TECHNOLOGY IN RSFSR GRAIN FARMING

Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 4, Apr 85 pp 32-34

[Article by A. Osadchuk, chief of the Main Administration of Farming of the RSFSR Ministry of Agriculture: "Intensive Technologies for Grain Production"]

[Text] Last year the Politburo of the CPSU Central Committee approved measures for the introduction of intensive technologies of winter and spring wheat cultivation. In the Russian Federation wheat will now be cultivated by the advanced method on an area of more than 11 million hectares. The experience in the application of this technology on a number of farms has shown that even under extreme weather conditions such technology makes it possible to obtain a big increase in the harvest. A selection of materials concerning wheat cultivation on "industrial" tracts of land is published below.

The USSR Food Program approved by the May (1982) Plenum of the CPSU Central Committee stresses that grain production is the key problem in agriculture, on whose solution the satisfaction of the country's growing needs for high-quality food and fodder grain and the creation of the necessary state reserves depend. In accordance with it kolkhozes and sovkhozes in the Russian Federation are to increase the average annual output of grain to 134 or 136 million tons during the current five-year plan and to 140 or 142 million, during the 12th Five-Year Plan, which will comprise 56 percent of the general state production volumes during the indicated years. The republic has already received output close to what has been envisaged, that is, about 129 million tons in 1973 and 136.5 million in 1978.

In order to exceed the established level with a stability of sown areas, the yield of the grain field must be increased significantly. Right now there are many farms obtaining high harvests annually. They exist in all economic regions. On many of them a hectare gives 30 quintals of grain and more. For example, in 1983 one out of every four farms in the republic gathered 20 quintals of grain per hectare and more than 5 percent of the kolkhozes and sovkhozes overstepped the line of 30.

For example, the Rossiya Kolkhoz in Novoaleksandrovskiy Rayon in Stavropol

Kray, on the average, gathered 33.4 quintals of grain per hectare during the years of the 10th Five-Year Plan and 34 quintals, during the 11th Five-Year Plan, including 39.6 quintals, in 1984; the Gigant Sovkhoz in the Tatar ASSR, 33.2, 42.1 and 44.2 respectively; the Rodina Kolkhoz in Vologda Oblast, 36.1, 43.5 and 54.4; the Kolkhoz imeni Lenin in Novomoskovskiy Rayon, Tula Oblast, 38.2, 39.1 and 43.6; the Uspenskiy Sovkhoz in Tyumen Oblast, 31.8, 37 and 45.2.

The nigher degree of mastering of scientifically substantiated farming systems and the strict observance of technological discipline -- the chief thing that ensures success for advanced farms lies in this. Pulling up lagging farms to the level of advanced farms is the most important task and a vast reserve of increase in the production of grain and other products. For example, specialists and scientists in Kemerovo Oblast have calculated that the possible yield of grain crops under these conditions is realistic at the level of 21.9 quintals per hectare in the next few years; the production of 2 tons is within the power of every rayon. On the fields of the scientific institutions of this oblast, on state strain testing plots and on advanced farms it is even higher than the estimated yield. For example, during the years of the 11th Five-Year Plan the Yagunovskiy Sovkhoz, on the average, gathered 20.6 quintals of grain per hectare (23.7 in 1984) and the Oktyabrskiy State Pedigree Stock Plant, 23.8 as compared to 20.9 during the 10th Five-Year Plan. In the last few years the average yield of grain crops on the oblast's state strain testing plots has totaled 23 to 27 quintals per hectare. All this confirms the rightfulness of the performed calculations of the possibility of increasing the output of grain per hectare by 7.9 to 11.7 quintals in all the oblast's regions.

A comparatively high level of the yield of grain crops (27.9 quintals per hectare) has been formed in Ilishevskiy Rayon in the Bashkir ASSR during the years of the current five-year plan. This indicator is due mainly to the fact that all the rayon's farms stably obtain more than 20 quintals. There are no lagging farms here. At the same time, there are many kolkhozes and sovkhozes, where less than 10 quintals of grain per hectare are gathered annually.

Such a diversity is noted almost everywhere. Even in Krasnodar Kray, where, as is well known, soil is rich and the climate is beneficial, individual kolkhozes and sovkhozes obtain 10 to 15 quintals of grain per hectare. They are also in Moscow Oblast, whose farms have a higher material and technical potential. For example, in 1983 about 10 percent of the kolkhozes and sovkhozes in this oblast obtained only up to 14 quintals of grain per hectare, while the average oblast yield was 21.7 quintals.

Scientifically substantiated farming systems ensure an expanded reproduction of soil fertility and on this basis a rise in the yield of all agricultural crops on every kolkhoz and sovkhoz to the level possible in practice. The prerequisites for this are quite sufficient. The main one lies in the stabilization of the structure of utilization of arable land in scientifically substantiated terms, which enables farm agronomists to work with a perspective on a systematic increase in the fertility of every field and plot of land.

Farms in dry steppe regions have basically reached the required sizes of the

fallow field. This is of exceptionally great importance in the matter of increase in the yield and decrease in drops in grain production volumes here.

The fallow area in the RSFSR has now reached 13.5 million hectares--4 million more than the 1980 level. The volumes of fertilizer application have risen. A total of 3,908,000 tons of mineral fertilizers (in the active substance) and 183.7 million tons of organic fertilizers were utilized for the 1983 grain harvest, which was 14 and 27 percent (respectively) more than in 1980. The load per grain harvesting combine was lowered from 175 to 141 hectares. Areas sown with new varieties (regionalized as of 1976) are expanding. In 1984 the share of new varieties of wheat comprised 41 percent and of rye, 46 percent. They are winter wheat: krasnodarskaya-57, donskaya bezostaya, tarasovskaya-29 and tambovitsa; spring wheat: almaz, bezenchukskaya-139, saratovskaya-46 and omskaya-9; rye: chulpan. Highly effective, new toxic chemicals, that is, baytan, vitavax, fundazol and bayleton, and herbicides with new capabilities, that is, lontrel, dialen, triallate and others, have begun to go into production. All this has created the basis for the introduction of intensive technologies of cultivation of winter and spring grain crops.

The essence of such technologies lies in the placement of crops after the best predecessors in the crop rotation system; cultivation of high-yielding intensive-type varieties with a good quality of grain; high provision of plants with mineral food elements with due regard for their content in soil; fractional application of nitrogen fertilizers during the vegetative period according to the data of soil and plant diagnosis; integrated system for the protection of plants against weeds, pests and diseases; regulation of the growth of plants with retardants; prompt and qualitative fulfillment of all technological methods aimed at protecting soil against erosion, accumulating moisture and creating other favorable conditions for the development of agricultural crops.

At the same time, intensive technologies require not only a high-level application of fertilizers and plant protection agents, but also an accurate observance of doses and dates and methods of their application, which is attained by means of a permanent technological tract, the use of improved machines and attachments and their careful adjustment.

The object of intensive technologies is to ensure a considerable increase in the yield and an improvement in the quality of grain. Specifically, the task is set as follows: To obtain no less than 40 quintals and, in some rayons, 50 to 55 quintals of grain per hectare of winter crops sown according to intensive technology and to gather 30 to 40 quintals of winter crops and 20 to 22 quintals of spring wheat from fertilized clean fallow and 15 to 18 quintals of grain from areas sown with spring wheat—the second crop after fallow.

Another, no less important, problem, which intensive methods of cultivation should solve, is to improve the quality of food grain, primarily strong and durum wheat.

Intensive technologies of cultivation of winter grain crops began to be introduced in the Russian Federation in 1983. The following year they were applied on 83 farms in Lipetsk, Tambov and Moscow oblasts and in Krasnodar and

Stavropol krays on the total area of 15,000 hectares.

The results obtained on these farms are very impressive. For example, on the Rossiya Kolkhoz in Novoaleksandrovskiy Rayon in Stavropol Kray 55 quintals of grain per hectare were gathered on an area of 475 hectares of winter wheat cultivated according to intensive technology and only 36 quintals, on the entire kolkhoz. The production cost per quintal of grain in the first case totaled 3.03 rubles and in the second, 3.37. The sales price exceeded the base price by 2.37 rubles, because wheat of intensive cultivation was accepted by the state as strong. Every quintal of it gave 7.24 rubles of net income and 398.2 rubles per hectare. Additional expenditures per hectare (45.17 rubles) were recovered through an increase of 19 quintals in the output of grain worth 195.13 rubles, that is, every ruble of additionally invested funds gave products worth 4.31 rubles. The Pobeda Kolkhoz in Petrovskiy Rayon in the same kray gathered 52.5 quintals of winter wheat per hectare on an area of 466 hectares—10.5 quintals more than the average on the farm—and the profit per hectare totaled 237.25 rubles.

Farms in Krasnodar Kray growing winter wheat according to intensive technology gathered 54.3 quintals of grain per hectare, that is, 9.6 quintals more than from control crops, the Kolkhoz imeni Gorkiy in Tbilisskiy Rayon, 66 quintals and the Experimental Production Farm imeni Kalinin in Pavlovskiy Rayon, 62. A higher content of gluten in grain, especially in wheat of the Krasnodarskaya-57 variety (up to 32.6 percent), was noted.

Moscow Oblast obtained 46.6 quintals of grain per hectare from intensive crops and the Sovkhoz imeni Kalinin, 55. Under the difficult conditions of last year the Komsomolets Sovkhoz in Tambov Oblast gathered 43.8 quintals of winter wheat per hectare from 100 hectares of such crops, while its average yield on the farm was only 24 quintals. Under the conditions of a sharp drought the Zavety Ilicha Kolkhoz in Lipetsk Oblast grew 36.5 quintals of grain per hectare on an area of 350 hectares.

For the harvest of the current year kolkhozes and sovkhozes in 23 oblasts, krays and autonomous republics sowed according to intensive technology more than 1,890,000 hectares of winter grain crops and on fertilized clean fallow, 3,336,000 and this spring farms in 16 oblasts, krays and autonomous republics will have to sow by intensive methods 5.9 million hectares of spring wheat, including 2.9 million, on clean fallow.

To fulfill this program, mineral fertilizers were allocated additionally and volumes of other material resources were established. The task of agricultural bodies and farm managers and specialists is to ensure a high effectiveness of investments and to additionally obtain no less than 10 million tons of high-quality wheat and rye.

Work is proceeding in this direction. A total of 562,000 tons of the active substance of mineral fertilizers--108 kg per hectare--and 97.6 million tons of organic fertilizers--26 tons per hectare of intensive sowings and 16 tons on clean fallow--were applied to winter crops. More than 1.3 million hectares of winter crops of intensive cultivation were placed on fields of overall cultivation.

All sown seeds were treated with fundazol, baytan and granozan. Treatment with fundazol was carried out against snow mold in the nonchernozem zone. Simazin was also used there. Herbicides of the 2.4D type were applied on 860,000 hectares of sown areas in the North Caucasus, the Volga Area and central chernozem and other oblasts. Winter wheat was treated against pests on sizable areas in Krasnodar and Stavropol krays and in Voronezh and Rostov oblasts.

Basically, first-category seeds were sown. The area of winter wheat sown with strong varieties comprises 87 percent and valuable varieties occupy the remaining part. Winter rye is represented mainly by the chulpan variety.

However, by no means everything that has been envisaged by technologists for fall has been done. In spring mineral fertilizers will have to be brought up to the calculated norms in Voronezh, Kuybyshev, Penza and Saratov oblasts and a large volume of work on the topdressing of crops and their treatment with herbicides, retardants and toxic chemicals will have to be done.

With regard to spring wheat of intensive cultivation the delivery of fertilizers, pesticides, equipment and other material resources to farms in accordance with the calculations should be completed right now. For sowing only seeds of the first category of intensive-type varieties of strong and durum wheat must be selected, disinfected carefully and, if needed, treated with retardants. For every field a document must be drawn up and a detailed technological chart must be worked out.

It is necessary to strictly maintain the calculated doses of fertilizers, to attain their balance in food elements and to think out the technique of application in detail. We must keep in mind that intensive technologies presuppose a high effectiveness of application of fertilizers and other chemicalization agents.

The growing of spring wheat by intensive methods is concentrated mainly in steppe regions, where, as a rule, the upper soil layer overdries rapidly. Therefore, fertilizers should be applied at a depth, where they would be in the wet layer in the zone of growth of the root system. The utilization of plowshares designed by the Bashkir Agricultural Institute installed on SZS-2.1 seeders and, in more arid regions, of plowshares developed by the Siberian Scientific Research Institute of Mechanization and Electrification of Agriculture and by the Siberian Scientific Research Institute of Agriculture makes it possible to solve this problem well.

On the eve of field work it is necessary to check the readiness of machines for the crushing of fertilizers, loading facilities and dissolving units and the adjustment of equipment for the application of herbicides, toxic chemicals and retardants. This is very important, because hectare doses of application of individual preparations are measured only by several hundreds of grams.

The task of specialists is to ensure from the first days of sowing a set of operations aimed at an improvement in the quality of grain, to promptly make a leaf and tissue diagnosis on all areas of strong and durum wheat, to organize

with due regard for its results the foliar topdressing of these crops and to ensure a reliable protection of plants against the stink bug and other pests and diseases. In this connection special attention must be drawn to the placement of sowings of durum wheat—a crop very demanding on its predecessor. Basically, clean fallow and in zones more provided with moisture the perennial grass layer should become the predecessor.

Only a full system of measures at all the stages of preparation and application of intensive technologies can ensure their high effectiveness, a substantial increase in the output of grain and a significant improvement in the technological merits of food wheat.

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7 January 1986